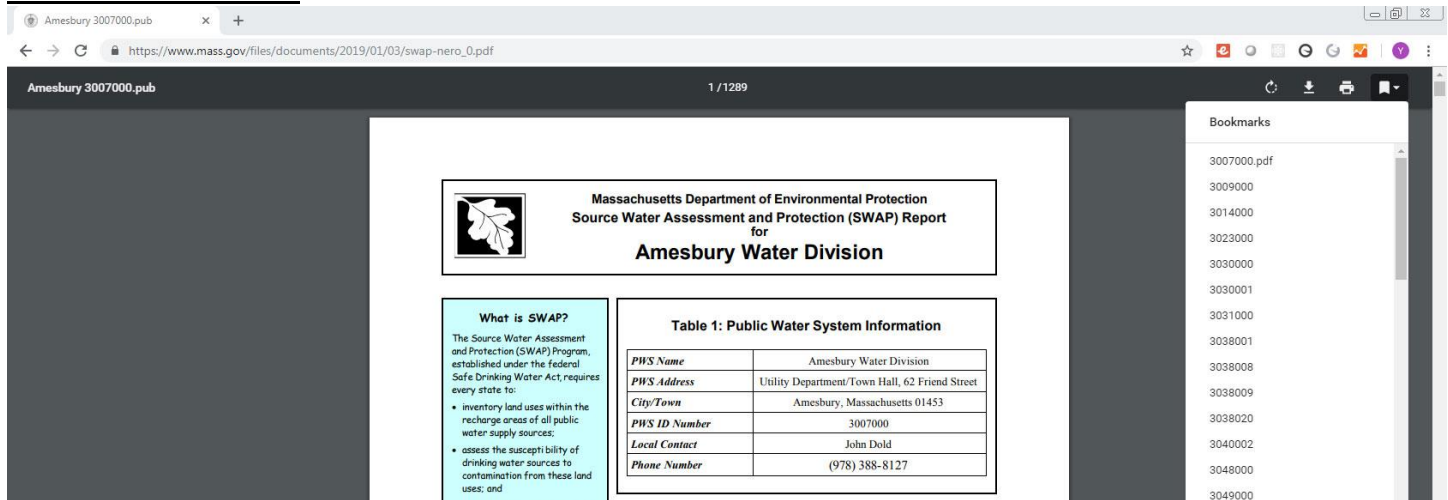


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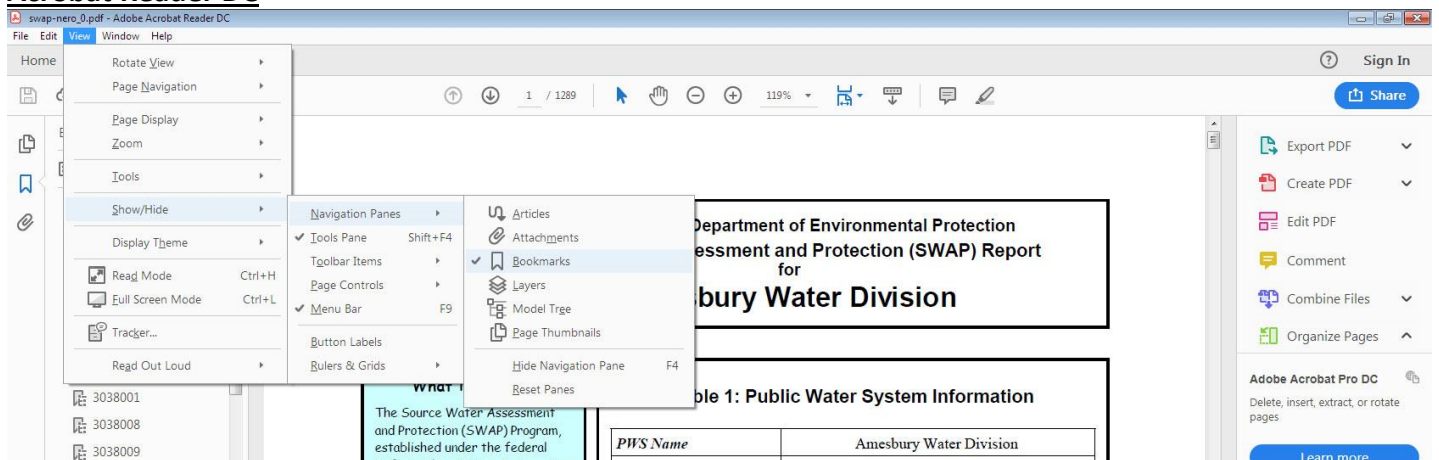
This PDF SWAP report file contains bookmarks which can be used to locate a particular SWAP report (see screenshots below for common PDF programs). The bookmarks are named using the PWS ID # of the public water system.

If you do not know the PWS ID #, you can also perform a search of the document by holding down the “CTRL” (⌘ on Mac) and the “F” key. This will open up the Find functionality. Type the name of the PWS into the textfield provided.

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Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

for

Amesbury Water Division

Wh

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

Table 1: Public Water System Information

PWS Name	Amesbury Water Division
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Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

for

Wee Forest Folk

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

? Inventory land uses within the recharge areas of all public water supply

Table 1: Public Water System (PWS) Information

PWS NAME	Wee Forest Folk
PWS Address	887 Bedford Road
City/Town	Carlisle, Massachusetts 01921
PWS ID Number	3051019



**Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Abington/Rockland Joint Water Works**

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Abington/Rockland Joint Waterworks
<i>PWS Address</i>	96 East Water Street
<i>City/Town</i>	Rockland, MA 02370
<i>PWS ID Number</i>	4001000
<i>Local Contact</i>	Daniel Callahan, Manager
<i>Phone Number</i>	781-878-0901

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells and reservoirs may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

This report includes the following sections:

1. Description of the Water System;
2. Land Uses in the Protection Areas;
3. Source Water Protection;
4. Source Water Protection Recommendations;
5. Additional Resources Available for Source Water Protection; and
6. Appendices.

Section 1: Description of the Water System

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

<i>Groundwater Sources</i>		<i>Susceptibility: High</i>
<i>Source Name</i>	<i>Source ID #</i>	
Myers Ave. Well #1	4001000-01G	
Myers Ave. Well #2	4001000-02G	
Myers Ave. Well #3	4001000-03G	
Myers Ave. Well #4	4001000-04G	
<i>Surface Water Sources</i>		<i>Susceptibility: High</i>
<i>Source Name</i>	<i>Source ID #</i>	
Great Sandy Bottom Pond	4001000-01S	
Hingham Street Reservoir	4001000-02S	

The Abington/Rockland Joint Waterworks has six drinking water sources, four ground water wells and two reservoirs. These sources serve residents and businesses in Abington and Rockland, as well as small areas of Hingham, Hanson, Pembroke and Weymouth.

The Myers Street wells are located in Abington. Their Zone II extends into Abington and Whitman. Great Sandy Bottom Pond and its watershed are located in Pembroke. Hingham Street Reservoir is located in Rockland. The watershed lies mostly within Rockland and Hingham, with a very small section extending into Hanover. The Waterworks is currently expanding the volume of the Hingham Street Reservoir to meet the future water needs of the towns.

For current information on monitoring results and treatment or for a copy of the most recent Consumer Confidence Report, please contact the public water system contact person listed above in Table 1. Drinking water monitoring data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

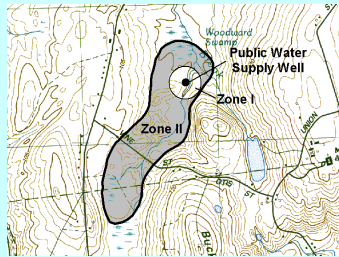
Section 2: Land Uses in the Protection Areas

The Zone II and watersheds for the Abington/Rockland system are primarily a mix of undeveloped forest and residential development, with smaller portions consisting of agriculture and industry. A Geographic Information Systems (GIS)

map showing the watershed boundaries, Zone A, Zone II and the percentages of land uses in the protection areas is provided as part of this report. Section 3 discusses protection measures implemented by the Abington/Rockland Joint Waterworks. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities in Appendix B.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Key Land Uses and Protection Issues Include:

1. Residential Land Uses
2. Transportation Corridors
3. Transmission Lines
4. Hazardous Waste Generation
5. Industrial Park (including a large quantity toxic user)
6. Agriculture
7. Oil or Hazardous Material Contamination Sites
8. Aquatic Wildlife
9. Sand and Gravel Mining
10. Road and Maintenance Depots
11. Underground Storage Tank

1. Residential Land Uses – Over 17% of the Zone II and watersheds consists of residential homes. Thirty-nine percent (39%) of the Zone II and watersheds is undeveloped forest with the potential for more residential development. The Massachusetts Executive Office of Environmental Affairs (EOEA)'s web site, www.state.ma.us/envir/, provides detailed information and maps about the build-out of developable land in communities in Massachusetts.

If managed improperly, household hazardous waste, septic systems, lawn care

and pet waste can all contribute to ground and surface water contamination. Household hazardous wastes include automotive wastes, paints, solvents and other substances that should be disposed of properly at a municipal collection site. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Improperly applied fertilizers and pesticides can wash off lawns and into surface waters. Pet waste may contain bacteria, parasites or viruses that are health risks. Residences are located throughout the Zone A.

Residential Land Use Recommendations:

- ✓ Work with town officials to control residential growth on undeveloped land.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the protection areas extend.
- ✓ Educate residents on how to protect water supplies. Distribute the fact sheet *Residents Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Post water supply awareness signs on streets throughout the watersheds and Zone II.
- ✓ Work with town boards to review and provide recommendations on proposed watershed or Zone II development.

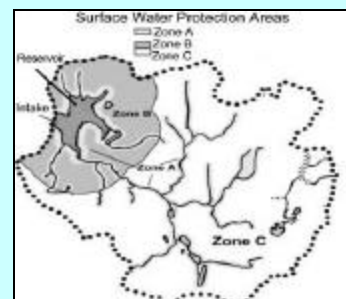
2. Transportation Corridors (paved and unpaved local roads and highways)

are located near the reservoir, throughout the watersheds, and within the Zone II. Spills from vehicular accidents are a major concern. In addition, roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

Stormwater can transport contaminants into ground and surface waters, including wetlands. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Potential contaminants may come from automotive leaks, maintenance, washing, or accidents.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Transportation Corridor Recommendations:

- ✓ Establish vegetated buffers along roads and parking areas to provide some filtration of contaminants.
- ✓ Schedule regular street sweeping. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.
- ✓ Post water supply awareness signs on streets throughout the watersheds and Zone II.
- ✓ Conduct emergency drills to be ready for spills.
- ✓ Regularly inspect the watersheds and Zone II for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps are not available yet, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Transmission (Utility) Lines - Transmission lines run through the Zone I of the wells. These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

Transmission (Utility) Lines Recommendations:

- ✓ Monitor the YOP for pesticide applications.

4. Hazardous Waste Generation – A Large Quantity Generator of Hazardous Waste is located within the watershed of the Hingham Street Reservoir. If hazardous wastes are improperly stored, they become potential sources of contamination.



Figure 1: Sample watershed with examples of potential sources of contamination

Hazardous Waste Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet *Businesses Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.

5. Industrial Park, including a Large Quantity Toxic User (LQUTU) - There is an industrial park located within the watershed of the Hingham Street Reservoir. Chemical use, handling and storage is a concern.

Industrial Park Recommendations:

- ✓ Request that businesses contact you in the case of spills or releases.
- ✓ Encourage BMPs for handling, storing and disposing of chemicals and metals.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

Refer to Appendix B for more information on regulated facilities.

Land Uses	Quantity	Threat	Source		Potential Sources of Contamination*
Agricultural					
Fertilizer Storage or Use	Few	M	-	01S	leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H	-	01S	leaks, spills, improper handling, or over-application of pesticides
Industrial					
Chemical Storage Or Manufacture	Few	H	-	02S	spills, leaks, or improper handling or storage of chemicals of process waste
DEP Tier Classified Oil Release Sites	4	not ranked	01-04G	02S	see Appendix C for more information
Industrial Park (including Large Quantity Toxic User)	1	H	-	02S	spills, leaks or other releases of chemicals or metals; improper storage or handling
Residential					
Fuel Oil Storage (at residences)	Numerous	M/M	01-04G	01, 02S	spills, leaks, or improper handling of fuel oil
Lawn Care / Gardening	Numerous	M/M	01-04G	01, 02S	over-application or improper storage and disposal of pesticides
Septic Systems / Cesspools	Numerous	M/M	01-04G	01, 02S	microbial contaminants, improper disposal of hazardous chemicals

Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix B.
- For information about Oil or Hazardous Materials Sites, refer to Appendix C.

* **THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Miscellaneous					
Aquatic Wildlife	Seasonal	H	-	01S, 02S	microbial contaminants
Large Quantity Hazardous Waste Generator	1	H	-	02S	spills, leaks from improper handling/storage of hazardous materials and wastes; see Appendix B for more information
Transportation Corridors	Numerous	M/H	04G	01S, 02S	accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Transmission Lines	1	L	01-04G	-	spills from over-application or improper handling of pesticides; erosion from construction
Road & Maintenance Depots	3	M/M	01-04G	01S	spills and leaks from the use and storage of sand, salt, gasoline and chemicals
Sand & Gravel Mining	1	M	-	02S	spills and leaks from heavy equipment; erosion from dewatering; may draw illegal dumping
Underground Storage Tank	1	H	01-04G	-	leaks or spills of stored materials

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
 2. For more information on regulated facilities, refer to Appendix B.
 3. For information about Oil or Hazardous Materials Sites, refer to Appendix C.
- * **THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

6. Agriculture – Cranberry bogs are located within the watershed of Great Sandy Bottom Pond. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, underground and aboveground storage tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills. Agricultural activities can also be a potential source of microbial contamination. The Massachusetts Drinking Water Regulations, 310 CMR 22.00, prohibit animals within 100 ft. of drinking water reservoirs and their tributaries.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a U.S. Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.
- ✓ The Massachusetts Department of Food & Agriculture’s booklet titled “On-Farm Strategies to Protect Water Quality—An Assessment & Planning Tool for Best Management Practices” (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.
- ✓ Work with farmers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.

7. Oil or Hazardous Material Contamination Sites – DEP Tier Classified Oil and/or Hazardous Material Release Sites are located within the protection areas of the wells and the Hingham Street Reservoir. Refer to the attached GIS map and Appendix C for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress of any ongoing remedial action conducted for the known oil or hazardous material contamination sites.

8. Aquatic Wildlife - Geese are seasonally present on, or adjacent to, the reservoir. Waterfowl may increase coliform levels through the release of fecal matter into the water and may also carry other bacteria and viruses. Waterfowl

Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

management techniques may include noise and visual harassment, habitat modification and control of food sources. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

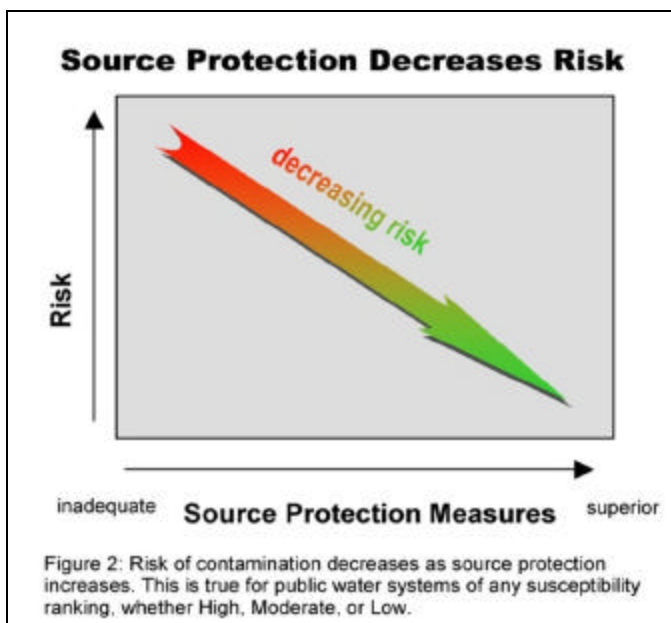
Aquatic Wildlife Recommendation:

- ✓ Monitor wildlife populations in and around the reservoir. Discourage feeding of geese and other waterfowl.

9. Sand & Gravel Mining - The Waterworks is undertaking an ambitious project to increase the volume of the Hingham Street Reservoir. This multi-year project involves the removal of a large amount of earthen material.

Sand & Gravel Mining Recommendation:

- ✓ Continue with site inspections and the use of appropriate erosion control and dewatering practices.



10. Road & Maintenance Depots - Abington and Whitman's Department of Public Works (DPW) yard is located within the Zone II. Pembroke's DPW yard is located within the watershed of Great Sandy Bottom Pond. Salt, sand and gasoline are used or stored at these facilities. At the time of the SWAP assessment, Whitman also had a significant amount of earthen and other materials stockpiled at their DPW yard.

Road & Maintenance Depots Recommendations:

- ✓ See Appendix A for *DPWs Protect Drinking Water*.
- ✓ Maintain contact with Whitman's DPW about the materials at their site and ensure that appropriate erosion controls are in place.

11. Underground Storage Tank (UST) - There is an underground fuel oil tank located at the wells.

UST Recommendation:

- ✓ Replace the underground fuel oil tank at the wells with an alternative fuel source when one is available at that site.

Section 3: Source Water Protection

As with many water supply protection areas, this system's Zone I, Zone II and watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. **The Abington/Rockland Joint Waterworks is commended for taking an active role in implementing source protection measures.** Some examples of their good work include the following.

Watershed Control

The Waterworks Manager does a good job of keeping up with conditions within the Zone I, Zone II and watersheds.

Emergency Planning and Response

The Joint Waterworks has an emergency plan and has tested the plan with other local responders.

Communication with Watershed Communities

The Waterworks Manager communicates with town boards in the various towns and has established a watershed protection protocol to stay aware of proposed land use changes within those communities.

SECTION 4: SOURCE WATER PROTECTION RECOMMENDATIONS

DEP recommends that the Joint Waterworks implement the following source protection measures.

- ✓ Work with Abington, Rockland, Pembroke and Whitman to control residential growth on undeveloped land.
- ✓ Educate residents, especially those abutting Great Sandy Bottom Pond, and businesses about their role in drinking water protection.
- ✓ Maintain water supply awareness signs along roads in the Zone II and watersheds.
- ✓ Discourage birds from lingering at the reservoir.
- ✓ Continue with work to plan for emergencies, including spills.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and watersheds.
- ✓ Work with Whitman to monitor solid waste at DPW yard.
- ✓ Replace the underground fuel oil tank at the wells with an alternative fuel source when one is available at that site.
- ✓ Develop and implement a protection plan. DEP guidance to develop plans is available at <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Hire a staff person to coordinate and conduct wellhead and watershed protection work.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with the watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow to the Zone II.
2. The groundwater in this area probably discharges to surface water feature such as a river rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Section 5: Additional Resources Available for Source Water Protection

DEP staff, informational documents and resources are available to help build on this SWAP report and to help improve drinking water protection.

Information about DEP Tier Classified Oil or Hazardous Material Release Sites can be obtained at DEP's Bureau of Waste Site Cleanup's web site, www.state.ma.us/dep/bwsc. Sites are identified on the attached GIS map and site specific information is available in Appendix C.

Section 6: Appendices

- A. Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
- B. List of Regulated Facilities.
- C. Table of Tier Classified Oil and/or Hazardous Material Sites.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

- 1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- 2. MA DEP SWAP Strategy
- 3. Land Use Pollution Potential Matrix
- 4. Draft Land/Associated Contaminants Matrix

For More Information

www.state.ma.us/dep

The following DEP staff can be contacted for more information and assistance on improving watershed protection.

Mike Quink, 508-946-2766, DEP's Southeast Regional office
Kathy Romero, 617-292-5727, DEP's Boston office

For More Information

Contact Mike Quink in DEP's Lakeville office at (508) 946-2766 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I and Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	NO 01G-04G	Monitor Zone I activities.
	NO 01S-02S	Monitor Zone A activities. See 310 CMR 22.20B for Zone A restrictions.
Are the Zone I and Zone A posted with “Public Drinking Water Supply” Signs?	YES	Water supply awareness signs should be posted along roads in the Zone II and watersheds. Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO 01G-04G	Monitor Zone I activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	NO	Work with local Planning Boards to compare land use controls to see that they meet current requirements of 310 CMR 22.21(2) and 310 CMR 22.20C. Refer to mass.gov/dep/brp/dws/ for model bylaws, health regulations, and current state regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	YES	Stay aware of proposed development in the watersheds and Zone II and provide recommendations on protection measures to town boards.
Planning		
Does the PWS have a local surface water and well-head protection plan?	NO	Develop surface water and wellhead protection plans. Follow <i>Developing a Local Wellhead Protection Plan</i> and <i>Developing a Local Surface Water Supply Protection Plan</i> available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with the Fire Department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a water supply protection committee?	NO	Encourage the formation of a committee to include representatives from citizens’ groups, neighboring communities and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	For more guidance see <i>Hazardous Materials Management: A Community's Guide</i> at www.state.ma.us/dep/brp/dws/files/hazmat.doc .
Does the PWS provide water supply protection education?	YES	Continue to educate residents about their role in drinking water protection. Appendix A contains the fact sheet <i>Residents Protect Drinking Water</i> .



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Brookside Mobile Home Park

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
June 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Brookside Mobile Home Park
PWS Address	1094 Main Street
City/Town	Acushnet, Massachusetts 02743
PWS ID Number	4003002
Local Contact	Richard Ellis
Phone Number	(781) 849-4476

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	220	600	Moderate
Well #2	02G	220	600	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Brookside Mobile Home Park's water supply comes from two deep bedrock wells located in a field to the north of the property. The wells each have a Zone I radii of 220 feet and an Interim Wellhead Protection Area (IWPA) radii of 600 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The wells serving the facility have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **above ground storage tanks (AST) with heating oil;**
3. **residential development; and**
4. **access road and parking.**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of moderate ranked threats within the Zone Is and IWPAs.

1. **Zone Is** – Currently, Well #2 meets DEP Zone I regulations and Well #1 does not meet DEP's Zone I regulations because of the homes on the edge of its Zone I. DEP's Zone I regulations (310 CMR 22.21(2)) only allow for water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The Zone Is are owned by the Brookside Mobile Home Park. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ When possible, remove non-water supply activities from the Zone I of Well #1.
2. **Aboveground Storage Tanks (AST)** – Some of the homes within the protection area (Zone I and IWPA) use fuel oil stored in above ground storage tanks. Leakage and spills of fuel oil have the potential to contaminate groundwater supplies.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
residential development	Yes	Yes	Moderate	runoff from lawns, wastewater leakage, above ground storage tanks
above ground storage tanks	Yes	Yes	Moderate	leaks, spills
access road and parking	No	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendation:

- ✓ Encourage the use of propane to reduce the threats associated with fuel oil.
- ✓ Inspect condition of tanks on a regular basis.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. Residential Development – There is high density residential development within the IWPA.

Recommendation:

- ✓ Educate residents in the IWPA about water supply protection. A brochure is included in this packet.

4. Access Road and Parking – The Park's access road and vehicle parking is within the edge of the IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Use minimal deicing agents on access road.
- ✓ Map stormwater drainage from roads and parking areas, direct drainage out of Zone Is.
- ✓ Contact Fire Department in the event of a spill.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Brookside Mobile Home Park is commended for owning their Zone I area and keeping septic system components out of the wellhead protection area. Brookside Mobile Home Park should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ When possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Post water supply protections signs in the Zone I and IWPA.
- ✓ Prohibit public access to the wells by locking facilities.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the wells.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

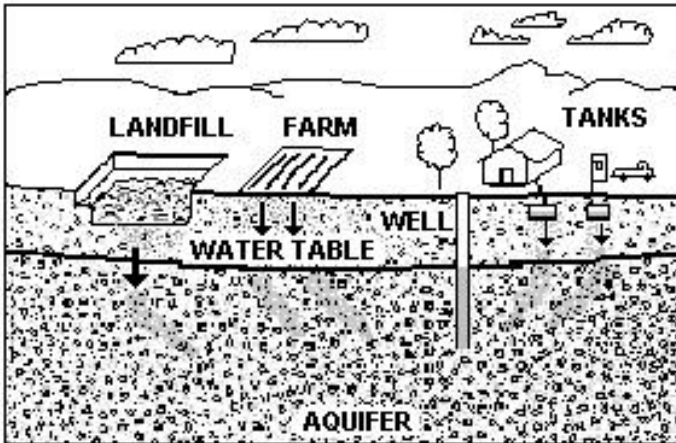


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Training and Education:

- ✓ Train residents on proper hazardous material use, disposal, emergency response, and best management practices.
- ✓ Post drinking water protection area signs at key visibility locations.

Facilities Management:

- ✓ Inspect and maintain the integrity of the ASTs and install containment where needed.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis (even though it is outside of the IWPA).

Planning:

- ✓ Work with local officials in town to include your IWPA in an Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Residents Protect Drinking Water
- Your Septic System Brochure
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Acushnet Mobile Home Park

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 3, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Acushnet Mobile Home Park
PWS Address	922 Middle Road
City/Town	Acushnet, Massachusetts 02743
PWS ID Number	4003004
Local Contact	Richard Ellis, Operator
Phone Number	(508) 922-0373

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4003004-01G	230	793	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for Acushnet Mobile Home Park is located in the middle of the park about 200 feet east of Middle Road. Well #1 has a Zone I of 230 feet and an Interim Wellhead Protection Area (IWPA) of 793 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Aboveground Storage Tank (AST) With Heating Oil; and**
3. **Stormwater; and**
4. **Lawncare and Landscaping**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Zone I contains high density residential land use with about 30 homes with above ground fuel oil storage, landscaping, roads and parking. The public water supplier owns most of the land for the Zone I, however, Middle Road runs through the edge of the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ When feasible, remove non-water supply activities from the Zone I to comply with DEP's Zone I requirements or consider relocation of the well.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Ensure that above ground storage tanks are properly contained to prevent spills.
2. **Aboveground Storage Tanks (AST)** – There are numerous ASTs located within the Zone I and IWPA. If managed improperly, Aboveground Storage Tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	Yes	Yes	Moderate	Tanks should be contained to prevent spills and leaks from contaminating groundwater.
Residences	Yes	Yes	-	Non-water supply structures in Zone I
Stormwater	Yes	Yes	Low	Stormwater can carry animal waste, lawn care chemicals and other hazardous materials into groundwater. BMPs can reduce the risk of groundwater contamination.
Landscaping	Yes	Yes	Moderate	Landscaping chemicals should not be used in the Zone I and ensure proper application elsewhere.

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to $\frac{1}{2}$ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. **Storm Water** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- ✓ Ensure stormwater flows out of Zone I area away from the well.
- ✓ Work with the Town to have to any catch basins on Middle Road inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

4. **Lawn care and Landscaping** – Landscaping is common in the Zone I and IWPA. Fertilizers and pesticides, if improperly applied or stored, can be potential sources of contamination to the water supply.

Recommendations:

- ✓ Instruct the lawn care and landscaping professionals never to use fertilizers or pesticides within the Zone I.
- ✓ Use best management practices when applying fertilizers or pesticides within the IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

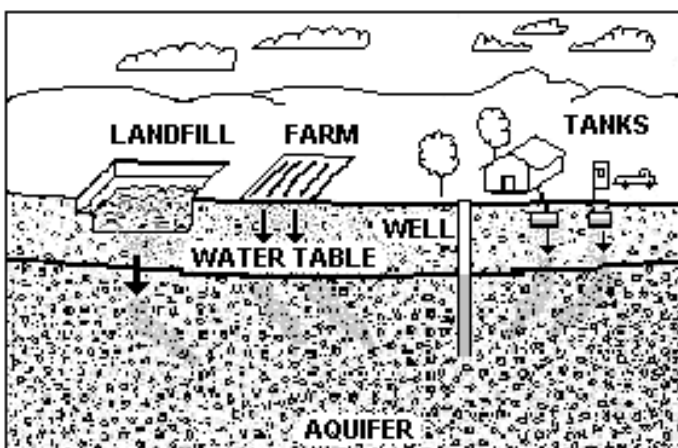


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Acushnet Mobile Home Park should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Ensure none of the above ground storage tanks in the development are leaking fuel to the ground.
- ✓ Educate residents on water supply protection practices including hazardous materials handling and proper landscaping practices.

Zone I:

- ✓ When feasible, remove non-water supply activities from the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities and fencing.

For More Information:

Contact Isabel Collins in DEP's Southeast Regional Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff and residents on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf>
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include your IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities

are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.

- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Long Plain Christian Nursery School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date DRAFT Prepared:
July 24, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Long Plain Christian Nursery School
PWS Address	10 Robinson Road
City/Town	Acushnet, Massachusetts
PWS ID Number	4003005
Local Contact	Manager, Jeanne Faria
Phone Number	(508) 763-3063

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4003005-01G	100	420	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the facility is located on the south side of Robinson Road near the facility. Well No. 1 has a Zone I radius of 100 feet and an Interim Wellhead Protection Area (IWPA) radius of 420 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Aboveground Storage Tanks (AST) With Heating Oil;**
3. **Private Septic Systems; and,**
4. **Lawn care/gardening.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone I. The facility's Zone I contains a school building, parking area and road, and landscaped areas. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Redirect road and parking lot drainage in the Zone I away from well.
2. **Aboveground Storage Tanks (AST)** – There are fuel oil ASTs located at some of the private residences within the IWPA. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the fuel oil they store.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	No	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
Lawn care/gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to $\frac{1}{2}$ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on impermeable surfaces, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. Private Septic Systems – Private septic systems are potential sources for the introduction of hazardous chemicals and microbial contaminants into the aquifer.

Recommendation:

- ✓ Encourage residences to regularly schedule maintenance and inspections of their septic systems and to properly disposal of household hazardous waste.
- ### 4. Lawn care/gardening – The pesticides and fertilizers used for lawn care and gardening can be transported from the ground surface down into the aquifer with storm water and excess irrigation water. The over-application or improper storage and disposal of pesticides and fertilizers could result in contamination of the aquifer.
- #### Recommendation:
- ✓ Inform the surrounding residences that they are located in the IWPA of a public water supply well and encourage them to use proper storage, disposal, and application procedures with pesticides and fertilizers.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Long Plain Christian Nursery School is commended for having a Wellhead Protection Plan and a formal Emergency Response Plan. Long Plain Christian Nursery School should review and adopt the key

recommendations above and the following:

Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.

Zone I:

- ✓ Conduct regular inspections of the Zone I.
- ✓ If Long Plain Christian Nursery School intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Frequently sweep and properly dispose of debris buildup on

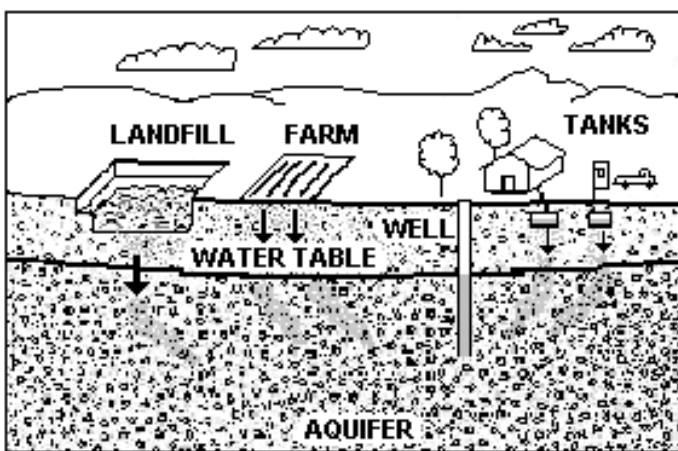


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

the parking lot and driveway.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff from Robinson Road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads around the well casing should slope away from the well and the well casing should extend above ground.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



**Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Attleboro Water Division**

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Attleboro Water Division
<i>PWS Address</i>	77 Park Street
<i>City/Town</i>	Attleboro, MA
<i>PWS ID Number</i>	4016000
<i>Local Contact</i>	Paul Nicholson, Superintendent, Department of Water & Wastewater
<i>Phone Number</i>	508-222-0019

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells and reservoirs may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

This report includes the following sections:

1. Description of the Water System;
2. Land Uses in the Protection Areas;
3. Source Water Protection;
4. Source Water Protection Recommendations;
5. Additional Resources Available for Source Water Protection; and
6. Appendices.

Glossary

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Section 1: Description of the Water System

<i>Surface Water Sources</i>		<i>Susceptibility: High</i>
<i>Source Name</i>	<i>Source ID #</i>	
Manchester Reservoir	4016000-03S	
Orr's Pond	4016000-04S	
Wading River	4016000-05S	

The Attleboro Water Division supplies drinking water to over 40,000 people in Attleboro, North Attleboro and Mansfield. There are three active surface water sources in the system: Manchester Reservoir, Orr's Pond and the Wading River. Water from Hoppin Hill Reservoir in North Attleboro flows into the Seven Mile River. This water spills into Luther Reservoir and then can be pumped to Manchester Reservoir or to Orr's Pond where there is a deep water intake. Manchester Reservoir and Orr's Pond are located in Attleboro. Their watershed extends into North Attleboro and Plainville. The surface impoundment on the Wading River is located in Mansfield. That watershed extends into Foxborough, Wrentham and Plainville, with small portions in North Attleboro and Norfolk.

For a copy of the Attleboro Water Division's Consumer Confidence Report or for current information on monitoring results and treatment, please call the system's contact person listed in Table 1. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Watersheds

The land uses within the watersheds consist of a mix of undeveloped forested land, residential development, businesses, agriculture, recreation and protected lands. Geographic Information Systems (GIS) maps showing the watershed boundaries, Zone A and the percentages of land uses in the watersheds is provided as part of this report. Section 3 discusses protection measures implemented by the Attleboro Water Division.

Protected open space is found in the following percentages in each watershed - Manchester Reservoir and Orr's Pond, 28%, and the Wading River, 38%.

Key Land Uses and Protection Issues include:

1. Aquatic Wildlife
2. Agriculture
3. Transportation Corridors
4. Transmission Lines
5. Residential Land Uses
6. Recreation
7. Active Underground Storage Tanks
8. National Pollutant Discharge Elimination System (NPDES) Major Discharge
9. small portion of a capped Solid Waste Facility
10. Oil or Hazardous Material Release Sites

1. **Aquatic Wildlife (Birds)** - Gulls are seasonally present on the surface waters. Waterfowl may increase coliform levels through the release of fecal matter into the water and may also carry other bacteria and viruses. Waterfowl management techniques may include noise and visual harassment, habitat modification and control of food sources. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

Aquatic Wildlife Recommendations:

- ✓ Observe wildlife populations in and around the reservoirs.
- ✓ Where necessary, discourage and control aquatic wildlife. See <http://mass.gov/dep/brp/dws/protect.htm> for guidance and permits.

2. **Agriculture** - Pasture and cropland comprise about 10% of the watershed of Manchester Reservoir and Orr's Pond. Runoff from these sites can cause fertilizers, bacteria, pesticides and other contaminants to enter surface waters. Runoff can be controlled through the use of appropriate Best Management Practices (BMPs) and other source protection measures. The Massachusetts Drinking Water Regulations prohibit domestic animals from within 100 feet of a public drinking water reservoir and its tributaries.

Agricultural Recommendations:

- ✓ Educate owners of small farms about watershed protection. DEP's web site has horsekeeping and manure management fact sheets at mass.gov/dep/consumer/animal.htm.
- ✓ The Massachusetts Department of Food & Agriculture's booklet titled "On-Farm Strategies to Protect Water Quality—An Assessment & Planning Tool for Best Management Practices" (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.

3. **Transportation Corridors (Local Roads and Highways)** are located adjacent to the reservoirs and throughout the watersheds. Interstate Routes 95 and 295 are located in the watershed for Manchester Reservoir and Orr's Pond. Interstate Routes 95 and 495 are located upstream of the surface impoundment on the Wading River.

Untreated stormwater and spills are the primary concerns. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Potential contaminants may come from automotive leaks, maintenance, washing, or accidents.

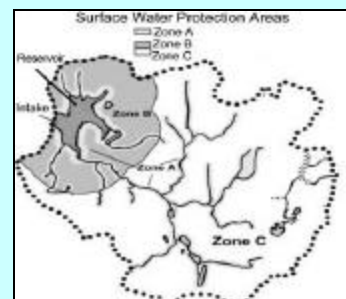
This is a difficult issue to address since most of the roads are not located within the community served by this system. Establishing vegetated buffers, scheduling regular street sweeping and conducting emergency drills can help to address impacts from roads. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.

Transportation Corridor Recommendations:

- ✓ Regularly inspect watersheds for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps are not available yet, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



4. Transmission (Utility) Lines (herbicide applications) - A transmission line runs through the watershed south of Orr's Pond in Attleboro and along the western edge of the Wading River watershed in North Attleboro and Plainville. These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an Integrated Pest Management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Transmission (Utility) Lines Recommendation:

- ✓ Monitor the YOP to ensure that pesticide applications will minimize impacts on drinking water sources.

5. Residential - Seventeen (17) percent of the Manchester/Orr's watershed and 22% of the Wading River watershed consist of residential use. Significant portions of the watersheds (44% and 57%, respectively) are undeveloped forest with the potential for more residential development. The Massachusetts Executive Office of Environmental Affairs (EOEA)'s web site, www.state.ma.us/envir/, provides detailed information and maps about the build-out of developable land in communities in Massachusetts.

If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to surface water contamination. Household hazardous wastes include automotive wastes, paints, solvents and other substances that should be disposed of properly at a municipal collection site. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Improperly applied fertilizers and pesticides can wash off lawns and into surface waters. Pet waste may contain bacteria, parasites or viruses that are health risks.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet *Residents Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the protection areas extend.

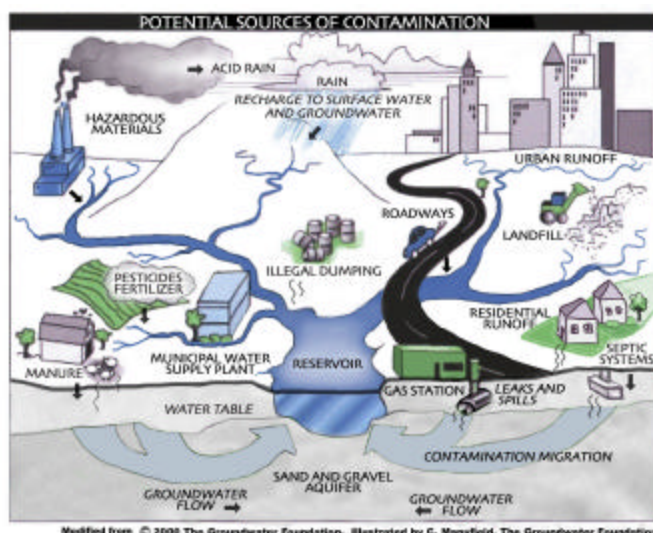


Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ Work with town officials to control residential growth on undeveloped land.
- ✓ Post water supply awareness signs on streets throughout the watersheds.
- ✓ Work with town boards to review and provide recommendations on proposed watershed development.

6. Recreation - The Massachusetts Drinking Water Regulations, 310 CMR 22.00, prohibit swimming and other bodily contact with a reservoir and its tributaries. Other activities, such as fishing and boating, are left up to the discretion of the local Board of Water Commissioners or like body having jurisdiction over the drinking water.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

Land Uses	Quantity	Threat	Potential Sources of Contamination*
Agricultural			
Fertilizer Storage or Use	Few	M	leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H	leaks, spills, improper handling, or over-application of pesticides
Manure Spreading	Few	H	erosion; improper handling or storage of manure
Residential			
Fuel Oil Storage (at residences)	Numerous	M	spills, leaks, or improper handling of fuel oil
Lawn Care / Gardening	Numerous	M	over-application or improper storage and disposal of pesticides
Septic Systems / Cesspools	Numerous	M	microbial contaminants, improper disposal of hazardous chemicals
Miscellaneous			
Aquatic Wildlife	Seasonal	H	microbial contaminants
Hiking/Fishing/Other Recreation	Seasonal	M	microbial contaminants
Transportation Corridors	Routes 95, 295, 495; local roads	H	stormwater; road salt; leaks or spills of fuels and other hazardous materials; over-application or improper handling of pesticides; erosion from construction
Transmission Lines	1	H	spills from over-application or improper handling of pesticides; erosion from construction
DEP Tier Classified Oil or Hazardous Materials	6	not ranked	see Appendix C for more information

Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
 - For more information on regulated facilities, refer to Appendix B.
 - For information about Oil or Hazardous Materials Sites, refer to Appendix C.
- * **THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Land Uses	Quantity	Threat	Potential Sources of Contamination*
Miscellaneous (continued)			
part of a capped solid waste facility - site owner has an Air Operating Permit and is listed as a Large Quantity Generator of Hazardous Waste (LQG) and a Hazardous Waste Treatment, Storage and/or Disposal Facility (TSDF)	1	H	seepage of leachate; surface runoff; erosion
NPDES major discharge	1	H	unintended release of materials
active underground storage tanks	< 10 in GIS database	M	spills, leaks or improper handling of stored materials

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
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Recreation Recommendations:

- ✓ If activities are allowed, a set of rules should be adopted by the Water Commissioners, inspections should be conducted to ensure adherence to the rules and users should be educated about drinking water protection.
- ✓ The water system may establish a more stringent buffer area depending upon local conditions such as soils, topography and proximity to intakes.

7. **Active Underground Storage Tanks** - There are underground storage tanks located within both watersheds.

UST Recommendation:

- ✓ Encourage the owners of the tanks to install secondary containment.

8. **NPDES Discharge** - There is a facility with a NPDES discharge within the watershed of Manchester and Orr's Ponds.

NPDES Recommendation:

- ✓ Ask to be contacted by the facility operator in the case of spills or unexpected releases of wastewater or chemicals.

9. **Capped Solid Waste Facility** - a small portion of a capped solid waste landfill is located within the Wading River watershed north of Route 495. A monitoring program is in place.

Solid Waste Recommendation:

- ✓ Review test results from the monitoring program.

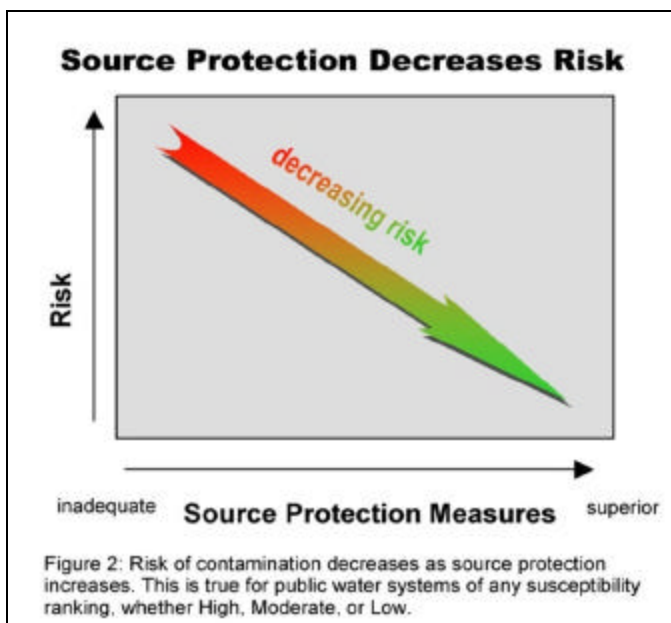
10. **Oil or Hazardous Material Release Sites** - DEP Tier Classified Oil or Hazardous Material Release Sites are located within the watershed of the Wading River. Refer to the attached GIS map and Appendix C for more information.

Oil/Hazardous Materials Recommendation:

- ✓ Educate businesses on best management practices for protecting water supplies. Distribute the fact sheet *Businesses Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.

Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Section 3: Source Water Protection

As with many water supply protection areas, this system's watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. **The Attleboro Water Division is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas.**

The Water Division performs frequent watershed inspections; monitors public access to water supply lands; and conducts educational programs in the schools. In addition, the Water Division works cooperatively with other town boards to review and comment on proposed plans for development in the watersheds and purchased an additional 50-acre parcel of land within the Manchester Reservoir watershed.

Section 4: Source Water Protection Recommendations

- | develop a waterfowl management program
- | do not allow domestic animals closer than 100 ft. from the reservoirs (or more, depending upon local conditions, such as soils, topography, location of intake)
- | work with farmers to incorporate best management practices into their operations
- | maintain signs denoting the public water supply lands
- | continue to conduct regular inspections
- | communicate with watershed communities about protection measures and emergency response
- | stay aware of proposed new and expanding development within the watersheds
- | provide comments to local town boards on proposals for development, where appropriate
- | provide technical assistance and educational programs (start with residents within Zone A)
- | work with the watershed communities and Mass Highway to limit the amount of deicing chemicals used on the roads
- | encourage stormwater improvement projects on local and state roads
- | request that street sweeping be conducted on a regular, seasonal basis

Section 5: Additional Resources Available for Source Water Protection

DEP staff, informational documents and resources are available to help build on this SWAP report and to help improve drinking water protection.

Information about DEP Tier Classified Oil or Hazardous Material Release Sites can be obtained at DEP's Bureau of Waste Site Cleanup's web site, www.state.ma.us/dep/bwsc. Sites are identified on the attached GIS map and site specific information is available in Appendix C.

Section 6: Appendices

- A. Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
- B. List of Regulated Facilities.
- C. Table of Tier Classified Oil and/or Hazardous Material Sites.

For More Information

www.state.ma.us/dep

The following DEP staff can be contacted for more information and assistance on improving watershed protection.

Mike Quink, 508-946-2766, DEP's Southeast Regional office

Kathy Romero, 617-292-5727, DEP's Boston office

For More Information

Contact Mike Quink in DEP's Lakeville office at (508) 946-2766 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

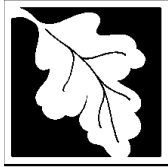
Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Table 3: Current Protection and Recommendations

Protection Measures	Status	Comments/Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	NO	Monitor Zone A activities. See 310 CMR 22.20B for Zone A restrictions.
Is the Zone A posted with Public Drinking Water Supply signs?	YES	Economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	YES	Continue inspections of drinking water protection areas.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C(2)?	NO	Refer to 310 CMR 22.20C(2), and mass.gov/dep/brp/dws/ for model by-laws, health regulations, and current state regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	NO	Stay aware of proposed development in the watershed and Zone II and provide recommendations on protection measures to town boards.
Planning		
Does the PWS have a DEP-approved surface water supply protection plan?	NO	Refer to <i>Developing a Local Surface Water Supply Protection Plan</i> available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal Emergency Response Plan to deal with spills or other emergencies?	YES	Coordinate an emergency response drill with the local team.
Does the municipality have a water supply protection committee?	NO	The Water Division Superintendent works with community groups to promote water supply awareness and protection.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	For more guidance see <i>Hazardous Materials Management: A Community's Guide</i> at www.state.ma.us/dep/brp/dws/files/hazmat.doc .
Does the PWS provide water supply protection education?	YES	Continue to educate residents about their role in drinking water protection. Appendix A contains the fact sheet <i>Residents Protect Drinking Water</i> .



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Avon Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Avon Water Division
<i>PWS Address</i>	65 East Main Street
<i>City/Town</i>	Avon, Massachusetts 02322
<i>PWS ID Number</i>	4018000
<i>Local Contact</i>	John Tereault
<i>Phone Number</i>	(508)588-0414

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

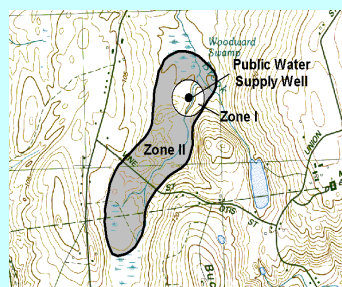
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 225

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
Memorial Well #1	4018000-01G
GP Well #2	4018000-02G
Theater GP Well #3	4018000-04G
Connolly Road Well #4	4018000-05G
Troutbrook Wells #7 & #8	4018000-06G

Zone II #: 507

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
Porter Well	4018000-03G

The Avon Water Division (Avon) maintains and operates six (6) public water supply sources. Avon's sources are located within the Taunton River Basin. The Porter Well (03G) wellhead protection area is located entirely in Avon; the Memorial Well #1 (01G), inactive GP Well #2 (02G), Theater Well #3 (04G), Connolly Road Well #4 (05G), and Troutbrook Wells #7 & #8 (06G) wellhead protection area is located in Avon, Brockton, and Holbrook. These wells are located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Avon are primarily a mixture of forest and residential land uses, with a small portion consisting of industrial and commercial activities (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Chemical and Hazardous Materials Storage and Use
3. Road and Maintenance Depots
4. Residential Land Uses
5. Transportation Corridors
6. Oil or Hazardous Material Contamination Sites
7. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the Memorial Well #1, GP Well #2, Theater GP Well #3, Connolly Road Well #4, Troutbrook Wells #7 & #8, and Porter Well is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone Is – The Zone I for all of Avon's wells is a 400 foot radius around each wellhead, except for the Troutbrook Wells #7 & #8 tubular wellfield, for which the Zone I is a 250-foot radius around each well. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following activities are located in the Zone Is for Avon's wells: Memorial Well #1 (01G) and GP Well #2 (02G) contain several commercial buildings and parking for numerous cars, a local road, and residential properties; Porter Well (03G) contains residential properties, commercial buildings and parking for numerous cars, and a local road; Theater GP Well #3 (04G) contains a portion of a commercial building; Connolly Road Well #4 (05G) contains a local road and residential property; Troutbrook Wells #7 & #8 (06G) contains a very small portion of a railroad right-of-way. Rights-of-way are a potential source of contamination because of the possibility of chemical releases during track maintenance or the over-application or improper handling of herbicides used during rights-of-way maintenance.



Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Work with the local Conservation Commission to make sure the wetland/stream resource areas are properly delineated in the field prior to the application of pesticide and that the supplier review the Yearly Operating Plan (YOP) from the railroad. These plans are approved directly by the Department of Food and Agriculture, with copies being sent to the local Conservation Commission.

2. Chemical and Hazardous Materials Storage and Use – Many large and small businesses use hazardous materials, produce

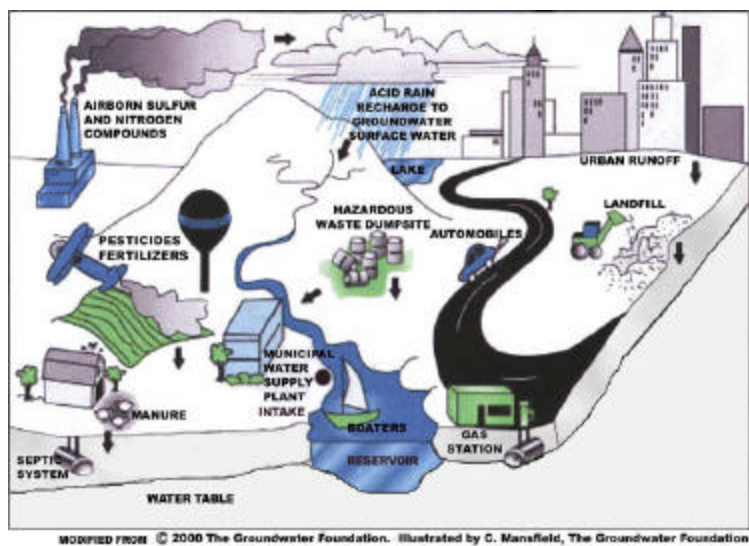


Figure 1: Sample watershed with examples of potential sources of contamination

hazardous waste products, and/or store large quantities of hazardous materials in Underground Storage Tanks (USTs)/Aboveground Storage Tanks (ASTs). Although many facilities within the watershed use best management practices (BMPs), hazardous materials and waste can be unexpectedly released through spills, leaks or improper handling or storage, and become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on BMPs for protecting water supplies, and encourage them to use BMPs for handling, storing and disposing of hazardous waste. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.



- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.
- ✓ Continue to plan and prepare for spills by communicating with municipalities and facilities in the Ipswich River watershed, and by conducting drills.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on BMPs for protecting water supplies, and encourage them to use BMPs for handling, storing and disposing of hazardous waste. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.

Source Protection Decreases Risk

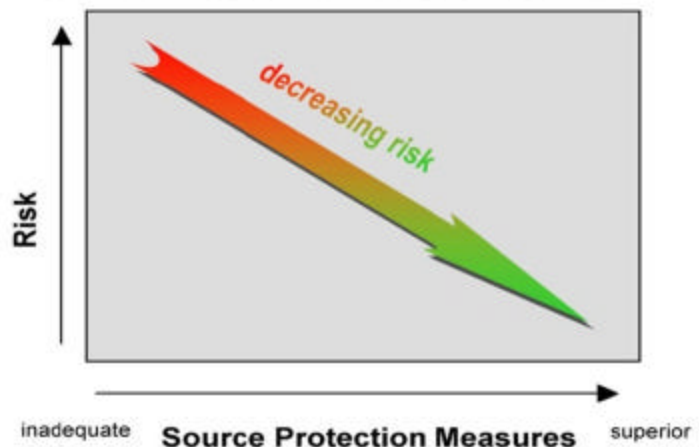


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

(Continued on page 7)

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources
Commercial				
Body Shops	3	H	225	Improper management of vehicle paints, solvents, and primer products
Gas Stations	2	H	225	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	2	H	225	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	2	H	225	Spills, leaks, or improper handling of fuels and maintenance chemicals
Cemeteries	2	M	225	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids (such as arsenic)
Dry Cleaners	1	H	507	Spills, leaks, or improper handling of solvents and wastes
Junk Yards and Salvage Yards	1	H	225	Spills, leaks, or improper handling of automotive chemicals, wastes, and batteries
Photo Processors	1	H	225	Spills, leaks, or improper handling or storage of photographic chemicals
Railroad Tracks and Yards	1	H	225	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Repair Shops (Engine, Appliances, Etc.)	1	H	225	Spills, leaks, or improper handling or storage of engine fluids, lubricants, and solvents
Industrial				
Electronics/Electrical Manufacturers	1	H	507	Spills, leaks, or improper handling or storage of chemicals and process wastes
Electroplaters	1	H	507	Spills, leaks, or improper handling or storage of solvents and other chemicals
Industry/Industrial Parks	1	H	507	Spills, leaks, or improper handling or storage of industrial chemicals and metals
Hazardous Waste Storage, Treatment and Recycling	1	H	225	Spills, leaks, or improper handling or storage of hazardous materials
Residential				
Fuel Oil Storage (at residences)	100+	M	225, 507	Fuel oil: spills, leaks, or improper handling
Lawn Care/Gardening	100+	M	225, 507	Pesticides: over-application or improper storage and disposal

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources
Residential (cont.)				
Septic Systems/Cesspools	100+	M	225, 507	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	2	M	225	Spills, leaks, or improper handling of materials stored in tanks
Oil or Hazardous Material Sites	10	--	225, 507	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Depots	2	M	507	Spills, leaks, or improper handling or storage of deicing materials, automotive fluids, fuel storage, and other chemicals
Schools, Colleges, and Universities	1	M	507	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small Quantity Hazardous Waste Generators	3	M	225, 507	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/Retention Basins	Numerous	L	225, 507	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	L	225, 507	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	2	M	225, 507	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	3	H	225	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	1	L	225, 507	Spills, leaks, or improper handling or storage of hazardous materials and waste
Waste Transfer/Recycling Stations	1	M	225	Improper management, seepage, and runoff of water contacting waste materials
Table 2 Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

3. Road and Maintenance Depots - Potential sources of contamination in state and municipal facilities can result from accidental dumping, spills, leaks, vehicle washing operations, or from wastewater treatment. Waste management and product storage pose the greatest threats with a wide variety of potentially harmful contaminants.

Road and Maintenance Depots Recommendations:

- ✓ Institute **Best Management Practices** - The New England Environmental Assistance Team provides municipalities in New England with information on how to comply with environmental requirements, and how to prevent pollution. For more information about this EPA sponsored program visit their website at <http://www.epa.gov/region1/steward/needat/muni/index.html>. Encourage road and maintenance depots to develop best management practices to ensure proper salt storage, proper maintenance of facilities and good housekeeping practices.
- ✓ Adequately size salt pile structure to allow for the loading and unloading of salt within the structure. Review the Department of Environmental Protection's Drinking Water Program Guidelines On Deicing Chemical (Road Salt) Storage at <http://www.state.ma.us/dep/brp/dws/files/saltgui.doc>.
- ✓ Encourage proper storage of materials at these facilities. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.

4. Residential Land Uses - Approximately 36% of the combined Zone IIs consist of residential areas, all of which are served by private septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

5. Transportation Corridors - Transportation corridors and other paved and unpaved local roads cross through the water supply protection areas. Spills from vehicular accidents are a major concern. In addition, roadway construction, maintenance, and typical highway use can all be potential sources of contamination.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drainage systems along transportation corridors. If maps aren't yet available, work with state and local officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone IIs can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone IIs. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

6. Presence of Oil or Hazardous Material Contamination Sites – The Zone IIs for Avon's wells contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000048, 4-0000318, 4-0000421, 4-0012357, 4-0015693, 4-0015811, 4-0016138, 4-0016152, 4-0016198, 4-0016272, 4-0017002, and 4-0017394. Refer to the attached maps and Appendix B for more information on these sites.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

7. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Currently, the Town of Avon does not have water supply protection controls. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with the Towns of Brockton and Holbrook to include Avon's source protection areas in local wellhead protection controls. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II are included in Table 2. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	To the extent possible, remove prohibited activities in Zone I to comply with DEP's Zone I requirements. Investigate options for gaining ownership or control of the Zone I.
Are the Zone Is posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone Is regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Monitor prohibited activities in Zone I, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have local controls that meet Wellhead Protection Regulations 310 CMR 22.21(2)?	NO	Work with the Planning Board and the Selectmen to develop bylaws that meet land use controls required by 310 CMR 22.21(2). Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	NO	Work with the towns of Brockton and Holbrook to encourage them to adopt local controls that include Dedham-Westwood's wellhead protection areas.
Planning		
Does the PWS have a wellhead protection plan?	Updating	The Town of Avon is in the process of developing a comprehensive water management plan that will address water/wastewater issues. Refer to "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Board of Water Commissioners and task force comprised of Fire Dept., Water Dept., Board of Health, and Building Inspector
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	YES	Increase residential outreach through bill stuffers and coordination with local groups. Aim additional efforts at commercial/industrial uses within the Zone II.

potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

Avon is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Conducting weekly inspections of the Zone IIs and reporting new activities that may impact wells
- Weekly inspections are also used to check on existing activities, especially those sites that may be potential sources of contamination
- Providing wellhead protection information through municipal newsletter
- Developing an overlay district for water supply protection

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above, and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone IIs. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Avon’s Water Supply Protection Areas

DEP’s datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP’s Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP’s Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state’s OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm> or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN).

RTN	Release Site Address	Town	Contaminant Type
4-0017002	3-5 and 7 East Main St.	Avon	Hazardous Material
4-0016198	3-5 East Main St.	Avon	Hazardous Material
4-0015811	57 Littlefield St.	Avon	Oil And Hazardous Material
4-0000421	100 Ladge Dr.	Avon	Oil And Hazardous Material
4-0017394	100 Ladge Dr.	Avon	Hazardous Material
4-0016138	138 Wilder St.	Brockton	Oil
4-0016152	138 Wilder St.	Brockton	Hazardous Material
4-0016272	138 Wilder St.	Brockton	Hazardous Material
4-0000048	1093 Montello St.	Brockton	--
4-0015833	75 Bodwell St.	Avon	Oil
3-0014978	55 High St and 99 Spring St.	Holbrook	Oil And Hazardous Material
4-0011748	1126 North Montello St.	Brockton	Oil

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Barnstable Fire District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Barnstable Fire District
<i>PWS Address</i>	18 41 Phinney's Lane
<i>City/Town</i>	Barnstable, Massachusetts
<i>PWS ID Number</i>	4020000
<i>Local Contact</i>	Jon Erickson
<i>Phone Number</i>	(508) 428-6691

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

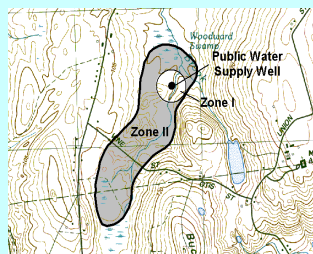
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 308

Susceptibility: High

Well Names	Source IDs
GP Well #1	4020000-01G

Zone II #: 311

Susceptibility: High

Well Names	Source IDs
GP Well #2	4020000-02G

Zone II #: 129

Susceptibility: High

Well Names	Source IDs
GP Well #3	4020000-03G
GP Well #4	4020000-04G

Barnstable Fire District (the District) relies on four groundwater wells to supply its customers with drinking water. The wells are located throughout the District; Well #1 is located on Phinney's Lane, Well #2 is located on Breeds Hill, and Wells #3 and #4 are located on Route 132. Each well has a Zone I of 400 feet. The four wells are located in three Zone II protection areas. Well #1 is located in Zone II #308, Well #2 is located in Zone II #311 and Wells #3 and #4 are located in Zone II #129. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i. e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All four of the District's wells have hexametaphosphate added for corrosion control, and in addition, Wells #3 and #4 receive potassium hydroxide for pH adjustment to assist in corrosion control. Well #2 is treated with aeration for the purpose of iron removal. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

A mixture of forest, residential and mining land uses dominates the Zone IIs for the District with small areas of commercial and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The four Zone Is for the wells are owned or controlled by the public water system and meet DEP's requirements. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Well #1 4020000-01G – A local road is located along the very edge of the Zone I.

Zone I Recommendations:

- ✓ Ensure that stormwater from the road adjacent to the Zone I for Well #1 is properly managed and, if possible, discharges outside of the Zone I area.
- ✓ Continue to keep all non water supply activities out of the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

Benefits of Source Protection

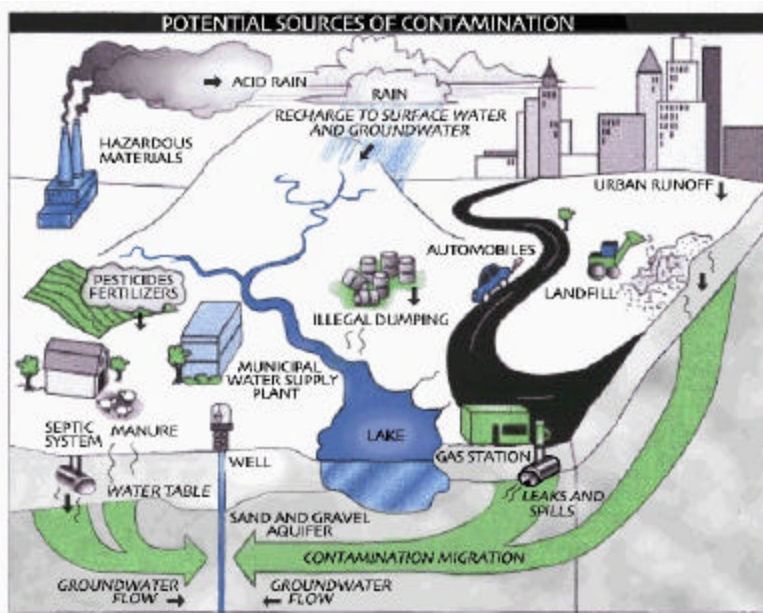
Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

2. Residential Land Uses – Approximately 28% of the Zone IIs consist of residential areas. About 30% of the area uses public sewer and so many use on site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents,



pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 6 runs through the Zone IIs for Wells #1, #3 and #4 and Route 132 runs through all three Zone IIs. Local roads are common throughout all of the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone Is.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use –

Although less than five percent of the land area within the Zone IIs is commercial or industrial

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

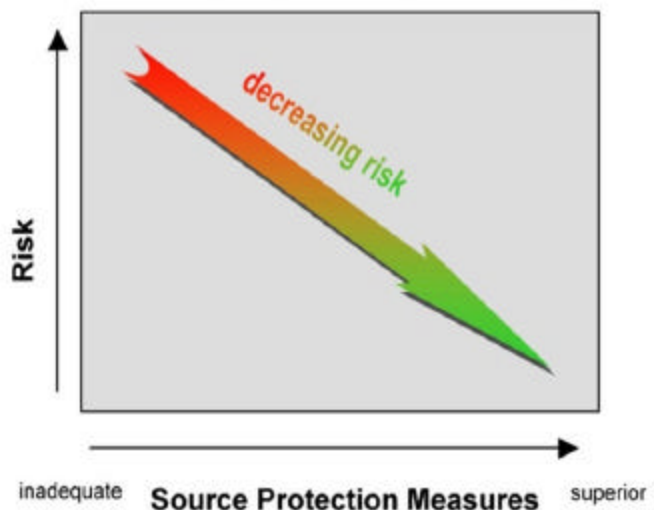


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	#129	Fertilizers: leaks, spills, improper handling, or over-application (Golf Course)
Landscaping	2	M	#129 & #308	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	#129	Pesticides: leaks, spills, improper handling, or over-application (Golf Course)
Commercial				
Airports	1	H	#311	Fuels, de-icers, salt, and other hazardous chemicals: spills, leaks, or improper handling
Body Shops	2	H	#311	Vehicle paints, solvents, and primer products: improper management
Gas Stations	2	H	#129 & #311	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	3	H	#129 & #311	Automotive fluids and solvents: spills, leaks, or improper handling
Boat Yards/Builders	1	H	#129	Fuels, paints, and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	#129	Fuels and maintenance chemicals: spills, leaks, or improper handling
Golf Courses	1	M	#129	Fertilizers or pesticides: over-application or improper handling
Laundromats	1	L	#311	Wash water: improper management
Paint Shops	1	H	#129 & #311	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Repair Shops (Engine, Appliances, Etc.)	3	H	#308 & #311	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	M	#308 & #311	Heavy equipment, fuel storage, clandestine dumping: spills or leaks

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	#308	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Food Processors	1	L	#311	Cleaners, other chemicals, microbial contaminants: spills, leaks, or improper handling or storage
Industry/Industrial Parks	1	H	#311	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	H	#311	Solvents and metal tailings: spills, leaks, or improper handling
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	2	M	#129 & #308	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	several	L	#129	Microbial contaminants
Fishing/Boating	several	L	#129	Fuel and other chemical spills, microbial contaminants
Small quantity hazardous waste generators	3	M	#308	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	several	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Road And Maintenance Depots	1	M	311	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way	1	L	All	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	several	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	8	H	All	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	4	L	#129 & #311	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	2	--	#129 & #311	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.

* Notes for Table 2 can be found on page 10.

(Continued from page 4)

land use, the activities associated with this land use can have significant impacts on water supplies. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II areas contain a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40000937. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, the Town has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Review your Wellhead Protection Plan and update to reflect current protection needs. Use your protection team to make updates and implement goals of the Wellhead Protection Plan. Refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone IIs include auto repair shops, gas stations, sand and gravel mining, a golf course and underground storage tanks. Refer to Table 2 and Appendix A for more information about these land uses.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Update Wellhead Protection Controls as needed. Refer to www.state.ma.us/dep/brp/dws/ for current model bylaws and health regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NA	Work with Barnstable to include Zone IIs from neighboring communities in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use protection committee to implement the goals of wellhead protection plan. Update as needed. Available resources include "Developing a Local Wellhead Protection Plan" at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Use Barnstable's Water Quality Advisory Committee to implement goals of wellhead protection plan.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone IIs.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the District's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Supporting and cooperating with the town to enact local controls that are more protective than DEP's source protection requirements.
- Being actively involved in decisions about land use planning that will impact Zone II recharge areas.
- Providing wellhead protection education to the golf course and consumers.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone Is regularly.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Update local bylaws and Wellhead Protection Plan as needed.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Notes for Table 2 (continued from page 6):

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 4

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
28812	Classic Coachworks Inc.	138 Thornton Dr.	Barnstable	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
29856	Hyannis Porsche Audi Inc.	Rte 132 and Phinney's Lane	Barnstable	HANDLR	SQG	Small Quantity Generator of Hazardous Waste
34277	Hyannis Restoration	119 Thornton Dr.	Barnstable	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
54361	Aggregate Industries Northeast Region	Off Phinny's Lane	Barnstable	PLANT	BM450	Air Quality Permit
54401	Cape Cod Aggregates Corp.	Hyannis Sand Dr.	Hyannis	HANDLR	SQG	Small Quantity Generator of Hazardous Waste
54696	Cape Cod Aggregates Corp	40 Ready Mix Dr.	Barnstable	PLANT	BM450	Air Quality Permit
54767	Sencorp Systems Inc.	400 Kidds Hill Rd.	Hyannis	PLANT	BM150	Air Quality Permit
54768	Cape Cod Potato Chip Co.	100 Breeds Hill Rd.	Hyannis	DISCH	IWWSC	Industrial Waste Water to Sewer
193398	All Cape Machine Shop	Thornton Dr Building 23	Hyannis	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
212459	Auburn Wire Inc.	75 Perseverance Way	Hyannis	TURPRT	BLW-TU	Below Toxics Use Reduction Regulations
215448	Sears Roebuck & Co 2323	1336 Phinny's Lane	Barnstable	HANDLR	SQG	Small Quantity Generator of Hazardous Waste
290191	Mama's Laundry	152 Breeds Hill Rd.	Barnstable	DISCH	IWWSC	Industrial Waste Water to Sewer
298291	Excel Switching Corp.	255 Independence Dr.	Hyannis	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
299831	Shepley Wood Products Inc.	216 Thornton Dr.	Barnstable	PLANT	BM1000	Air Quality Permit

DEP Permitted Facilities Continued

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
305649	Sears 7223	1336 Phinny's Lane	Barnstable	HANDLR	SQG	Small Quantity Generator of Hazardous Waste
311737	Town of Barnstable	1200 Phinny's Lane	Hyannis	FULDSP	FULDSP	Fuel Dispenser
368013	ExxonMobil Oil Corp	1449 Route 132	Hyannis	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
368013	ExxonMobil Oil Corp	1449 Route 132	Hyannis	FULDSP	FULDSP	Fuel Dispenser

Regulated Facilities information continues on following page.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 3 of 4

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
BARNSTABLE POLICE DEPARTMENT ID #1063	1200 PHINNEYS LN	HYANNIS	Reinforced	1 Wall	A	6000	Gasoline
			Reinforced	1 Wall		500	Gasoline
			Reinforced	1 Wall		1000	
CUMBERLAND FARMS #2187 ID #1107	ROUTE 132 & BEARSE WAY	HYANNIS	Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Diesel
HYANNIS SAND AND GRAVEL ID #1055	40 READY MIX DR	HYANNIS	Reinforced	2 Wall	A	10000	Diesel
			Reinforced	2 Wall	A	2500	Gasoline
MOBIL SS # 11730 ID #1104	1449 ROUTE 132	HYANNIS	Reinforced	2 Wall	I	10000	Gasoline
			Reinforced	2 Wall	I	10000	Gasoline
			Reinforced	2 Wall	I	12000	Gasoline
			Reinforced	2 Wall	I	1000	Waste Oil
NUVENT INC ID #1116	31 THORNTON DR	HYANNIS	Steel			275	Fuel Oil
TEXACO SERVICE LOC #11-143-0180 ID #1106	1140 IYANOUGH RD	HYANNIS	Reinforced	1 Wall	A	12000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	8000	Diesel
			Reinforced	1 Wall	I	550	Waste Oil

Underground Storage Tanks Continued

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
SUN ISLAND DELIVERY ID #700	10 HADAWAY RD	HYANNIS	Reinforced	2 Wall	I	8000	Diesel
			Reinforced	2 Wall	I	6000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000937	100 BREEDS HILL RD	BARNSTABLE-HYANNIS	Hazardous Material
4-0016597*	10 HADAWAY RD	BARNSTABLE-HYANNIS	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Centerville Osterville Marston Mills Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Centerville Osterville Marston Mills Water Department
<i>PWS Address</i>	1138 Main Street
<i>City/Town</i>	Barnstable
<i>PWS ID Number</i>	4020002
<i>Local Contact</i>	Craig Crocker
<i>Phone Number</i>	(508) 428-6691

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

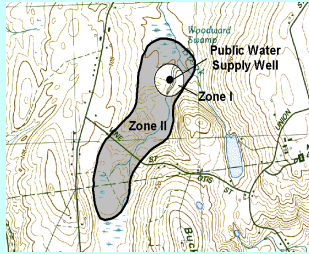
This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Susceptibility: High

Zone II #:	Well Names	Source IDs
297	#21 Hayden	4020002-18G
297	#22 Hayden	4020002-19G
298	#20 Hayden	4020002-17G
299	#18 Hayden	4020002-15G
300	#15 Hayden	4020002-12G
301	#14 Hayden	4020002-11G
301	#17 Hayden	4020002-14G
302	#16 Harrison	4020002-13G
302	#19 Harrison	4020002-16G
303	#12 Murray	4020002-09G
303	#13 Murray	4020002-10G
304	#5 Lumbert	4020002-03G
304	#9 Lumbert	4020002-05G
305	#3 / #4 Arena	4020002-02G
306	#10 Davis	4020002-06G
307	McShane #1	4020002-01G
317	#7 Craigville	4020002-04G
317	#8 Craigville	4020002-07G
317	#11 Craigville	4020002-08G

The 19 wells for the Centerville Osterville Marston Mills Water Department are located in 12 Zone II. Most areas of the Zone II are areas located within the Town of Barnstable, with some of the Zone II areas extending in to the southeastern section of the Town of Sandwich. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

All wells have potassium hydroxide added for corrosion control purpose, and Wells 06G, 14G, 15G and 17G are treated with phosphate to sequester iron compounds. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Centerville/Osterville are a mixture of residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Of the 19 Zone Is for the wells, 16 are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

- Well 04G (#7 Craigville) has 2 homes with septic systems within the Zone I.
- Well 05G (#9 Lumbert) and Well 04G (#7 Craigville) have roads within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

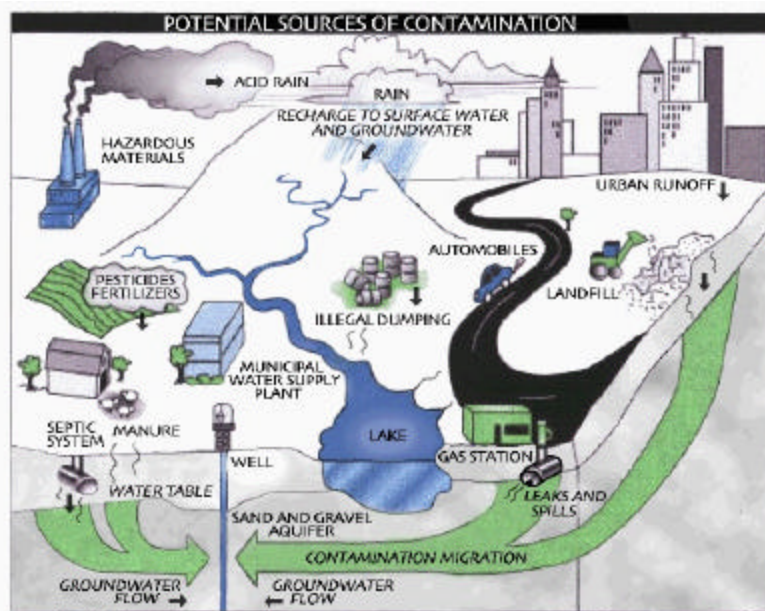
2. Residential Land Uses – A large portion of all of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and

other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

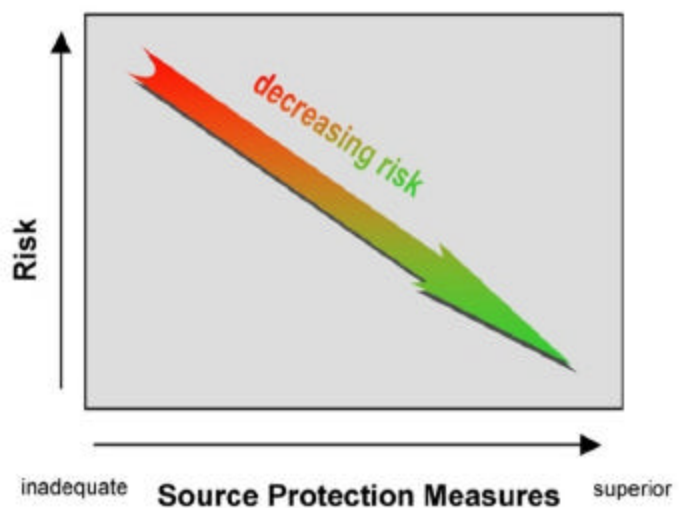


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources*
Agricultural				
Landscaping	numerous	M	All	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	several	M	All	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	several	H	All	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Body Shops	1	H	#317	Vehicle paints, solvents, and primer products: improper management
Service Stations/ Auto Repair Shops	2	H	#305 #306 #307	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	1	M	#307	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	2	M	#297 through #302	Fertilizers or pesticides: over-application or improper handling
Photo Processors	1	H	#305, #307	Photographic chemicals: spills, leaks, or improper handling or storage
Sand And Gravel Mining/ Washing	1	M	#297	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Industry/Industrial Parks	1	H	#305, #306, #307	Industrial chemicals and metals: spills, leaks, or improper handling or storage

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources*
Residential				
Fuel Oil Storage (at residences)	200+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	200+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	200+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Numerous	L	All	Microbial contaminants
Composting Facilities	1	L	#307	Organic material, animal waste, and runoff: storage and improper handling
Fishing/Boating	Several	L	All	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	#305, #306, #307	Seepage of leachate
Road And Maintenance Depots	1	M	#306, #307	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	2	M	#305, #307	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	L	#300, #301, #304-#307	Corridor maintenance pesticides: over-application or improper handling; construction
Waste Transfer/Recycling Station	1	M	#305, #306, #307	Water contacting waste materials: improper management, seepage, and runoff

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – A small percentage of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II #307 borders on a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 4-0000740. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are cranberry bogs throughout the Zone II. As is the case for most other crops, the commercial production of cranberries usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the

potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendations:

- ✓ Encourage Cranberry bog owner/operators to obtain and follow an approved USDA, Natural Resource Conservation Service Conservation Farm Plan. Utilization of best management practices (BMPs) as planned and described in an established conservation farm plan can ensure that agricultural system will uphold the integrity of the surrounding natural resources.
- ✓ Encourage Cranberry bog owner/operators to maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses and to follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, the Town of Barnstable does have water

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with the Town of Sandwich to include Zone II areas in their wellhead protection planning.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update and implement your wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Be sure to include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Continue to update and implement your Wellhead Protection Plan. Work with your protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, body shops, a capped landfill, and photoprocessors. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Working with the Cape Cod Land Bank to acquire more than 200 acres of land for drinking water source protection.
- Conducting educational outreach to businesses and residences on septic system maintenance to protect ground water.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Update and implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
35691	PINA EDWIN JR AND SON, INC	227 BUMPS RIVER RD	OSTERVILLE	GENERATOR OF HAZARDOUS WASTE	VERY SMALL QUANTITY GENERATOR
36593	MID WAY GARAGE FUEL	981 MAIN ST	OSTERVILLE	GENERATOR OF HAZARDOUS WASTE	VERY SMALL QUANTITY GENERATOR
39053	BARNSTABLE LANDFILL	FLINT ST	BARNSTABLE	LANDFILL	LANDFILL
39054	CAPE RESOURCES STUMP AND DUMP LANDFILL	280 OLD FALMOUTH RD	BARNSTABLE	LANDFILL	WOODWASTE LANDFILL
40018	BARNSTABLE TRANSFER STATION	FLINT ST	BARNSTABLE	TRANSFER STATION	TRANSFER STATION FOR HAZARDOUS MATERIAL
301279	GIFFORD BROTHERS SAND AND GRAVEL	810 WAKEBY RD	BARNSTABLE	AIR QUALITY PERMIT	AIR QUALITY PERMIT
356193	OSTERVILLE EXXON	792 MAIN ST	OSTERVILLE	FUEL DISPENSER	FUEL DISPENSER
361021	COTUIT LANDING SHOPPING CNTR	3860 FALMOUTH ROAD	BARNSTABLE	GROUNDWATER DISCHARGE	MAJOR GROUNDWATER DISCHARGE
366525	MID-WAY GARAGE	981 MAIN ST	OSTERVILLE	FUEL DISPENSER	FUEL DISPENSER

For information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000740	792 MAIN ST	BARNSTABLE	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Cotuit Fire District Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Cotuit Fire District Water Department
<i>PWS Address</i>	4300 Falmouth Road
<i>City/Town</i>	Barnstable
<i>PWS ID Number</i>	4020003
<i>Local Contact</i>	Ken Ventura
<i>Phone Number</i>	(508) 428-2687

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

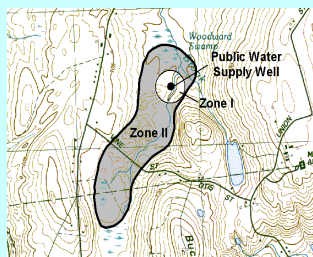
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II.

Section 1: Description of the Water System

IWPA

Susceptibility: High

Well Names	Source IDs
Main Station (inactive)	4020003-01G

Zone II #: 294

Susceptibility: High

Well Names	Source IDs
Station #5	4020003-06G

Zone II #: 295

Susceptibility: High

Well Names	Source IDs
Station #3	4020003-03G

Zone II #: 296

Susceptibility: High

Well Names	Source IDs
Station #1	4020003-02G
Station #2	4020003-04G
Station #4	4020003-05G

The six wells for the Cotuit Fire District Water Department are located in one IWPA and three Zone II. The wells are all located within the Town of Barnstable. The Zone II #294 and #296 extend in to the Towns of Sandwich and Mashpee, while Zone II #295 extends in to the Town of Mashpee. The Main Station wellfield (01G) has an IWPA and has been inactive for longer than five years. The Main Station wellfield would therefore need to go through the DEP New Source Approval process prior to reactivation, which would include an assessment of potential sources of contamination. The Zone I for the wellfield is a 250 foot radius around each well point, effectively a 250 foot radius around the perimeter of the wellfield. Each of the other wells has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I, IWPA, and Zone II.

Water from the wells is pH adjusted for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and IWPA for the Cotuit Fire District are a mixture of residential, commercial, and forested land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table

2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The six (6) Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: 4020003-01G, 4020003-03G, and 4020003-06G have residential properties within the Zone I. 4020003-06G also has a local road within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 50 % of each of the Zone II consist of residential areas. Some of the areas have public sewers, and the remainder use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

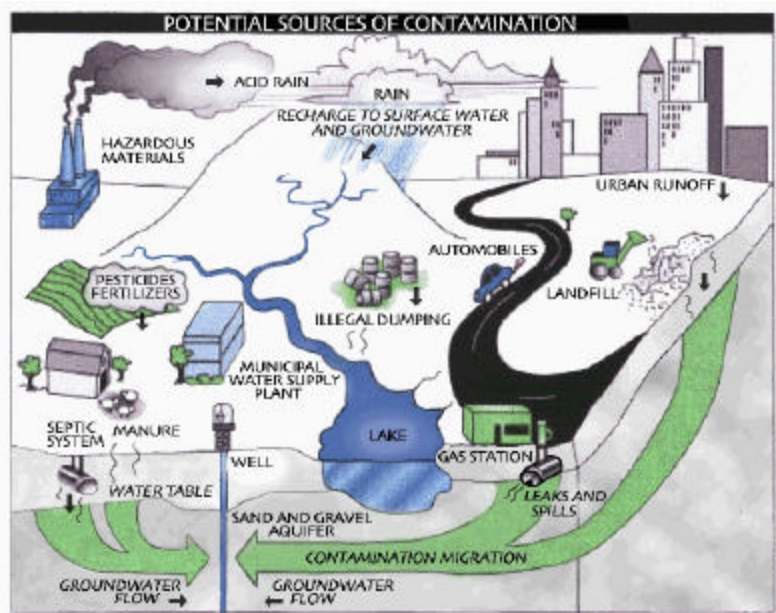
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Routes 130 and 28 run through the Zone II and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation

corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – A small percentage of the land area within the Zone II is commercial land uses. Many small businesses

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

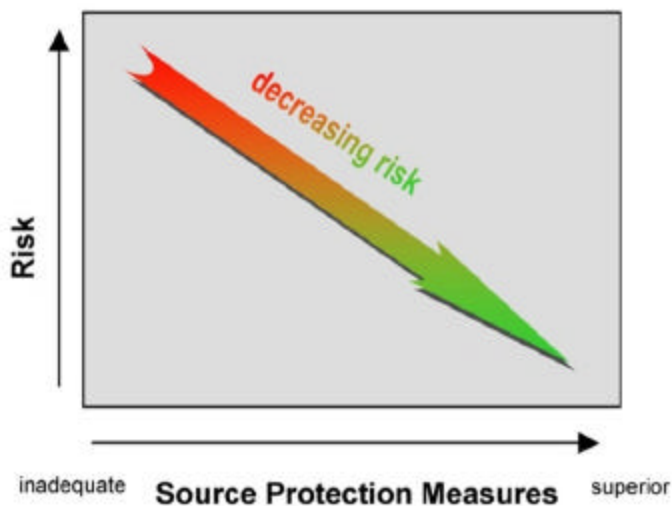


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II) *See Table 2 Notes on page 9.

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	#296	Fertilizers: leaks, spills, improper handling, or over-application
Landscaping	1	M	#296	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Manure Storage or Spreading	1	H	#296	Manure (microbial contaminants): improper handling
Commercial				
Gas Stations	2	H	#294, #296	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	2	H	#294, #295	Automotive fluids and solvents: spills, leaks, or improper handling
Printer And Blueprint Shops	1	M	#296	Printing inks and chemicals: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	25+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	25+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	25+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Oil or Hazardous Material Sites	2	--	#294, #296	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	1	M	#295	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way	1	L	#295, #296	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	2	H	#294, #296	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	1	L	#296	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Wastewater Treatment Plant	1	M	#294	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management

use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0015466 and 4-0014286. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural activities - There are several cranberry bogs and landscaping within the Zone II. As is the case for most other crops the commercial production of cranberries usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.



- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.
- ✓ Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with Sandwich and Mashpee to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Implement and update the wellhead protection plan as needed. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial and residential uses within the Zone II.

Protection Planning Recommendations:

- ✓ Implement and update your Wellhead Protection Plan as needed. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials in neighboring towns to ensure protection of Zone II areas and to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the most current regulations, encourage them to adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, gas stations, and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Implement and update your Wellhead Protection Plan as needed.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
 2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
 3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.
- * **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
137129	Santuit Oil	4418 Falmouth Ave	Cotuit	Fuel Dispenser	Fuel Dispenser

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Santuit Oil Co.	4418 Falmouth Rd	Cotuit	Gas Station	2 Wall	Interstitial Space Monitor	8000	Diesel
				2 Wall	Interstitial Space Monitor	8000	Gasoline
				2 Wall	Interstitial Space Monitor	8000	Gasoline
				2 Wall	Interstitial Space Monitor	4000	Diesel
Santuit Xtra Mart	Falmouth Ave	Cotuit	Gas Station	2 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

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For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0014286	135 Main St	Mashpee	Oil
4-0015466	4418 Rte 28	Cotuit	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Barnstable Water Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Barnstable Water Company
<i>PWS Address</i>	47 Old Yarmouth Road
<i>City/Town</i>	Barnstable, Massachusetts
<i>PWS ID Number</i>	4020004
<i>Local Contact</i>	David Condrey
<i>Phone Number</i>	(508) 775-0063

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

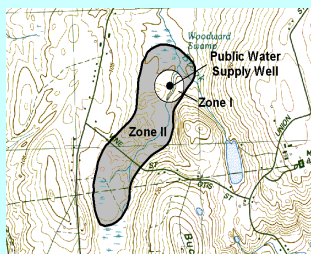
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 309

Susceptibility: High

Well Names	Source IDs
Mary Dunn Well #4	4020004-09G

Zone II #: 310

Susceptibility: High

Well Names	Source IDs
Mary Dunn Well #3	4020004-08G

Zone II #: 312

Susceptibility: High

Well Names	Source IDs
Mary Dunn Well #1	4020004-04G

Zone II #: 313

Susceptibility: High

Well Names	Source IDs
Mary Dunn Well #2	4020004-05G

Zone II #: 314

Susceptibility: High

Well Names	Source IDs
Airport Well #1	4020004-10G

Zone II #: 315

Susceptibility: High

Well Names	Source IDs
Maher Well #2	4020004-02G
Maher Well #1	4020004-07G
Maher Well #3	4020004-11G

Zone II #: 316

Susceptibility: High

Well Names	Source IDs
Straightway Well	4020004-01G
Hyannisport	4020004-03G
Simmons Pond	4020004-06G
Straightway Well	4020004-12G

The twelve (12) wells for the Barnstable Water Company are located in seven (7) Zone II. Zone II #315 extends in to the Town of Yarmouth, while the other Zone II are all within the Town of Barnstable. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can

prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Water from the wells is pH adjusted for corrosion control. Water from the Maher Wells, (wells 02G, 07G, and 11G) is also disinfected and treated for organics removal. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Barnstable Water Company are a mixture of residential, commercial, light industrial, and forested land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers

to own the Zone I, or control the Zone I through a conservation restriction. The twelve (12) Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

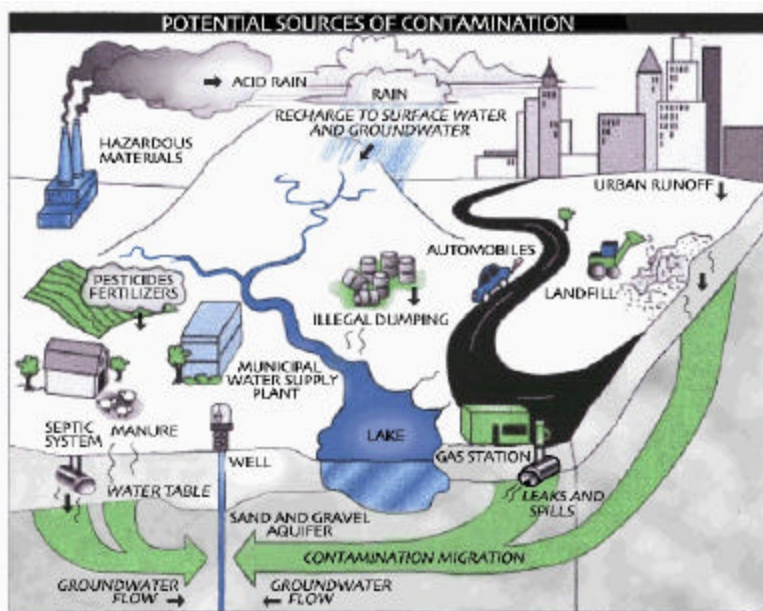
- Wells 03G, 04G, 08G and 09G have local roads within the Zone I.
- Wells 02G, 04G and 07G have unauthorized access within the Zone I.
- Wells 04G, 08G, 09G, and have a power line right-of-way within the Zone I.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I. Ensure that the power line right-of-way maintenance within the Zone I
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Portions of the Zone II consist of residential areas. 60 - 70% of the areas have public sewers while the remainder use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Routes 132 and 28 run through the Zone II and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other

(Continued on page 8)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

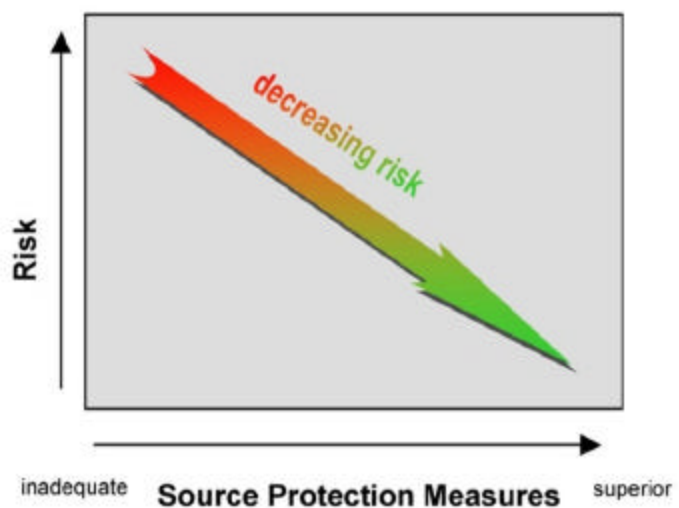


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	5	M	#310, #313, #314, #315, #316	Fertilizers: leaks, spills, improper handling, or over-application
Landscaping	1	M	#316	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	1	M	#316	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	5	H	#310, #313, #314, #315, #316	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Airports	1	H	#310, #312, #313, #314, #315	Fuels, de-icers, salt, and other hazardous chemicals: spills, leaks, or improper handling
Car/Truck/Bus Washes	4	L	#313, #315	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Body Shops	6	H	#309, #310, #313, #315	Vehicle paints, solvents, and primer products: improper management
Gas Stations	12	H	#310, #315, #316	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	10	H	#309, #310, #313, #315, #316	Automotive fluids and solvents: spills, leaks, or improper handling
Boat Yards/Builders	1	H	#316	Fuels, paints, and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	#315	Fuels and maintenance chemicals: spills, leaks, or improper handling
Dry Cleaners	2	H	#315, #316	Solvents and wastes: spills, leaks, or improper handling
Funeral Homes	1	L	#316	Hazardous chemicals: spills, leaks, or improper handling

*See Table 2 notes on page 11.

Table 2: Land Use in the Protection Areas (Zones I and II)- continued

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Commercial				
Furniture Stripping and Refinishing	1	H	#315	Hazardous chemicals: spills, leaks, or improper handling
Golf Courses	1	M	#316	Fertilizers or pesticides: over-application or improper handling
Junk Yards and Salvage Yards	1	H	#312, #313, #314	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Laundromats	3	L	#315, #316	Wash water: improper management
Medical Facilities	1	M	#310, #313	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Photo Processors	1	H	#316	Photographic chemicals: spills, leaks, or improper handling or storage
Printer And Blueprint Shops	1	M	#315	Printing inks and chemicals: spills, leaks, or improper handling or storage
Railroad Tracks And Yards	1	H	#314, #315	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Repair Shops (Engine, Appliances, Etc.)	10	H	#309, #312, #314, #315, #316	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Research Laboratories	1	M	#310, #313	Laboratory chemicals and wastes: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	1	M	#309, #310, #313	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Foundries Or Metal Fabricators	1	H	#315	Solvents and other chemicals: spills, leaks, or improper handling or storage
Industry/Industrial Parks	1	H	#310, #313	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	3	H	#310, #312, #313, #316	Solvents and metal tailings: spills, leaks, or improper handling
Residential				
Lawn Care / Gardening	100+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	75+	M	#313, #315, #316	Hazardous chemicals: microbial contaminants, and improper disposal

*See Table 2 notes on page 11.

Table 2: Land Use in the Protection Areas (Zones I and II) - continued

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous				
Aboveground Storage Tanks	4	M	#313, #315	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	10+	L	All	Microbial contaminants. Note: several ponds
Clandestine Dumping	10+	H	All	Debris containing hazardous materials or wastes
Fire Training Facilities	1	M	#310	Fuels and other chemicals: improper use or storage
Fishing/Boating	2	L	#312, #313, #316	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste Generators	2	H	#310, #313, #315	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	16	--	#310, #313, #314, #315, #316	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	2	M	#316	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	2	M	#316	Hazardous materials and waste: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way	1	L	#309, #310, #313	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	23	H	#310, #313, #314, #315, #316	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	3	L	#313, #314	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	10+	L	#309, #310, #313, #315, #316	Hazardous materials and waste: spills, leaks, or improper handling or storage
Wastewater Treatment Plant/Collection Facility/	1	M	#312 - #316	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper
Water Treatment Sludge Lagoon	1	M	#312 - #316	Sludge and wastewater: improper management

*See Table 2 notes on page 11.

(Continued from page 4)

potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run through the water supply protection areas. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Portions of the land area within the Zone II are commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0010893, 4-0000937, 4-0001081, 4-0011301, 4-0000279, 4-0012134, 4-0014257, 4-0012911, 4-0000026, 4-0000392, 4-0014264, 4-0013422, 4-0015670, 4-0015369, 4-0015974, 4-0000824, 4-0016335, 4-0000873, 4-0000823. Refer to the attached map and Appendix B for more information.

(Continued on page 10)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 8)

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, the Barnstable does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Continue to update and implement your Wellhead Protection Plan. Refer your protection team (the water quality advisory committee) to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.
- ✓ Establish a protection team, and use the protection team to implement the goals of the Wellhead Protection Plan for the Water Company.

Other land uses and activities within the Zone II include auto repair shops, gas stations, dry cleaners, machine/metalworking facilities, and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Posting water supply protection signs
- The acquisition and protection of land within the Zone II
- Working with the Town of Yarmouth to protect Zone II areas within Yarmouth.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- Education about Source Protection to consumers and elementary schools.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Table 2 Notes (pages 5, 6 & 7):

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
758	FOXRUN WWTP	770A MAIN ST	BARNSTABLE	Ground Water Facility (BRP)	Groundwater Discharge
1130	BARNSTABLE	MAIN ST	BARNSTABLE	Surface Water Facility (BRP)	Surface Water Discharge
10793	VERIZON NEW ENGLAND INC	16 HINKLEY RD	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
27543	PACKAGING IND GROUP INC	AIRPORT RD	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
27578	BAY STATE PIPING CO INC	174 AIRPORT RD	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
28100	PURITAN PONTIAC ISUZU INC	460 YARMOUTH RD	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
28103	TRANS ATLANTIC MOTORS INC	RTE 28 AT AIRPORT CIR	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
28812	CLASSIC COACHWORKS INC	138 THORNTON DR	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
29031	TRACY V W SUBARU INC	RTE 132	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
29493	HOWARD BOAT SHOP INC	BEALE WAY	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
29856	HYANNIS PORSCHE AUDI INC	RTE 132 & PHINNEYS LN	HYANNIS	Generator of Hazardous Waste	Small Quantity Generator

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
30085	HYANNIS NISSAN PEUGEOT	STEVENS & NORTH STS	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
30356	BUCKLERS GMC INC	100 RIDGEWOOD AVE	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
31109	AIRPORT MOTORS INC	IYANNOUGH RD RTE 132	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33318	BEARD DICK CHEVROLET	RIDGEWOOD AVE	HYANNIS	Generator of Hazardous Waste	Small Quantity Generator
33475	JOHNS RESTORATION INC	81 PLANT RD	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33629	FORD OF HYANNIS INC	332 FALMOUTH RD	HYANNIS	Generator of Hazardous Waste	Small Quantity Generator
33818	CASHS AUTO BODY	251 BARNSTABLE RD	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
34277	HYANNIS RESTORATION	119 THORNTON DR	HYANNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
35123	HYANNIS PORSCHE AUDI	860 W MAIN ST	BARNSTABLE	Generator of Hazardous Waste	Small Quantity Generator
36526	BARNSTABLE COUNTY HOUSE OF CORR	BARNSTABLE CO FARM MAIN ST	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
				Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
37068	CAPE COD COMMUNITY COLLEGE	RTE 132	WEST BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
54361	AGGREGATE INDUSTRIES NORTHEAST REGION	OFF PHINNEYS LN	HYANNIS	Plant	Air Quality Permit

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
54550	BARNSTABLE HIGH SCHO	744 WEST MAIN ST	BARNSTABLE	Plant	Air Quality Permit
54551	BARNSTABLE GRADE 5	HIGH SCHOOL RD.	BARNSTABLE	Plant	Air Quality Permit
54559	BARNSTABLE MIDDLE SC	895 FALMOUTH RD.	BARNSTABLE	Plant	Air Quality Permit
54667	ACME LAUNDRY CO	124 RIDGEWOOD AVE	BARNSTABLE	Plant	Air Quality Permit
54696	CAPE COD AGGREGATES CORP	40 READY MIX DR	HYANNIS	Plant	Air Quality Permit
54761	FOURNIER PETROLEUM	BROOKS RD	BARNSTABLE	Plant	Air Quality Permit
207609	PARTYLITE WORLDWIDE INC	232 MAIN ST	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
				Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
256328	PURITAN PONTIAC ISUZU GMC	90 HIGH SCHOOL RD EXT	BARNSTABLE	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
				Generator of Hazardous Waste	Small Quantity Generator
261220	HYANNIS TOYOTA	1020 IYANOUGH RD, RT 132	BARNSTABLE	Generator of Hazardous Waste	Small Quantity Generator
269096	EVERETT H CORSON INC	1040 RTE 132	BARNSTABLE	Recycler of Hazardous Waste	Large Quantity Generator of Hazardous Waste
				Recycler of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
286879	MID CAPE MEDICAL CENTER	RTE 28 AT BEARSES WAY	BARNSTABLE	Generator of Hazardous Waste	Small Quantity Generator

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
299831	SHEPLEY WOOD PRODUCTS INC	216 THORNTON DR	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
				Plant	Air Quality Permit
				Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
323394	SHELL 137772	590 IYANOUGH RD	BARNSTABLE	Fuel Dispenser	Fuel Dispenser
323394	MOTIVA ENTERPRISES LLC	590 IYANOUGH RD	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
336524	KARLS BOAT SHOP	61D BODICK RD	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
337375	AUTO ZONE 5160	332 RTE 28	BARNSTABLE	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
360147	BARNSTABLE TOWN OF	367 MAIN ST	BARNSTABLE	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
366954	ELDREDGE & BOURNE	538 BEARSES WAY	BARNSTABLE	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
368632	BROOKS PHARMACY	360 BARNSTABLE RD	BARNSTABLE	Generator of Hazardous Waste	Small Quantity Generator
370982	STEWART PAINTING	152 RIDGEWOOD AVE	BARNSTABLE	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
371234	SENTINEL PRODUCTS	96 AIRPORT RD	BARNSTABLE	Plant	Air Quality Permit

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

APPENDIX B (continued) – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0010893		BARNSTABLE	
4-0000937	THE CAPE COD CO	BARNSTABLE	Hazardous Material
4-0001081	RAY BLACKBURN AUTO SALVAGE BAP	BARNSTABLE	Oil
4-0011301	TEXACO STATION	BARNSTABLE	Hazardous Material
4-0000279	THE STRAIGHT WAY	BARNSTABLE	Hazardous Material
4-0012134	AT CORNER OF TEVYAN RD	BARNSTABLE	Oil
4-0014257	CUMBERLAND FARMS	BARNSTABLE	Oil
4-0012911	GRIFFIN AVIONICS	BARNSTABLE	Oil and Hazardous Material
4-0000026	CHARTER STATION NO. 6843 FMR	BARNSTABLE	Oil
4-0000392	BP SERVICE STATION	BARNSTABLE	Oil
4-0014264	GARAGE	BARNSTABLE	Hazardous Material
4-0013422	BARNSTABLE MOBIL STATION	BARNSTABLE	Oil
4-0015670	D'OLIMPIO REAL ESTATE T	BARNSTABLE	Oil and Hazardous Material
4-0015369	JOSEPHS GAS STA FMR	BARNSTABLE	Oil
4-0015974	NO LOCATION AID	BARNSTABLE	Oil
4-0000824	ATWOOD OIL (HUBBARD OIL CO INC)	BARNSTABLE	Oil
4-0016335	PENTTIS AUTOMOTIVE	BARNSTABLE	Oil
4-0000873	AIRPORT MOTORS INC BAP	BARNSTABLE	Hazardous Material
4-0000823	BARNSTABLE AIRPORT	BARNSTABLE	Oil and Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Berkley Middle School & Town Offices

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Berkley Middle School & Town Offices
PWS Address	21 North Main Street
City/Town	Berkley, MA 02779
PWS ID Number	4027001
Local Contact	Anthony Rose/Frederick Parmenter
Phone Number	508-822-5220/508-947-1070

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #2	02G	250	600	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

The well provides drinking water to the Berkley Middle School and to the town offices. The well has a Zone I of 250 feet and an Interim Wellhead Protection Area (IWPA) of 600 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. The Zone I and IWPA consist mostly of undeveloped forest. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

The Zone I and IWPA are fairly well protected.

Key issues include the following.

1. **Zone I Issues**
2. **Ballfield**

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
ballfield	no	yes	moderate	overapplication or spills of pesticides & fertilizers

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the well is moderate based on the presence of at least one moderate ranking in Table 2.

1. Zone I – The public water system owns or controls the Zone I.

Recommendations:

Keep non-water supply activities out of the Zone I.

Conduct regular inspections of the Zone I.

Post water supply protection signs.

2. Ballfield - There is a ballfield within the IWPA.

Recommendation:

Do not use fertilizers or pesticides on the field.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. Facility operators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Conduct inspections of the Zone I.

Training and Education:

- ✓ Train employees on the proper use, handling, storage and disposal of hazardous chemicals at the Middle School.
- ✓ Post signs for water supply protection.

Facilities Management:

- ✓ Inspect and maintain septic system and above ground storage tank outside the IWPA.

Planning:

- ✓ Work with local officials in town to make sure that the well's IWPA is included in a local Aquifer Protection District Bylaw and to assist you in improving protection.

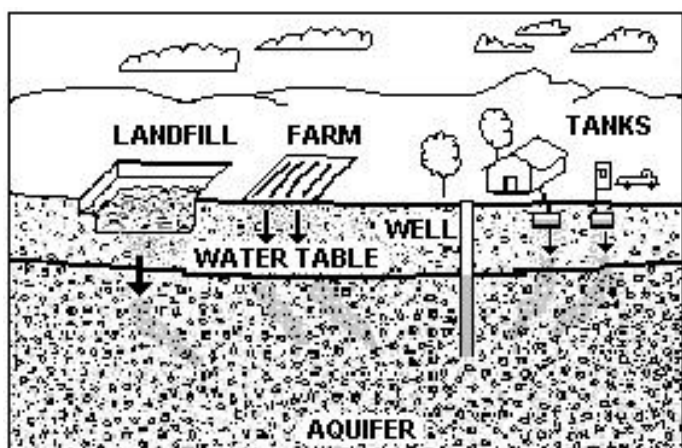


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures fact sheet
- Healthy Schools fact sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Bourne Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Bourne Water District
<i>PWS Address</i>	211 Barlow's Landing Road
<i>City/Town</i>	Bourne, Massachusetts 02532
<i>PWS ID Number</i>	4036000
<i>Local Contact</i>	Ralph Marks
<i>Phone Number</i>	(508) 563-2294

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

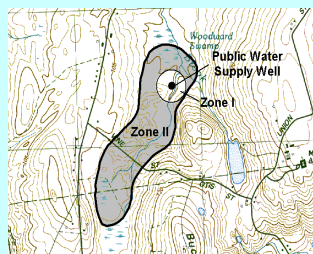
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 204

Susceptibility: High

Well Names	Source IDs
Pumping Station #1	4036000-01G
Well #2	4036000-02G
Well #3	4036000-03G
Well #4	4036000-04G
Well #5	4036000-05G
Well #6	4036000-06G

The Bourne Water District is supplied by 6 different sources of groundwater. One of the sources, Pumping station #1 (01G) is a wellfield of 4 gravel-packed wells. The other 5 sources are single gravel-packed wells. Wells 01G, 03G, 04G and 06G are located in Monument Beach within the Town Forest. The other two wells, 02G and 05G, are located in the Cataumet area of town. Each well has a Zone I of 400 feet except for the wellfield at Pumping Station #1, which has a Zone I of 250 feet around each of the 4 wells in the wellfield. Most of the Zone II is located in Bourne, however, one small area of the Zone II extends into Sandwich and another smaller area extends into Falmouth. A Large portion of the Zone II is located within the Massachusetts Military Reservation (MMR) which has been included in the federal superfund hazardous waste cleanup program. The sources are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view locations of the wells, extent of the Zone Is and the boundaries of the Zone II.

All 6 sources in Bourne Water District have lime slurry added for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for the Bourne Water District is a mixture of forest, residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Automotive Junkyard/Salvage Operation
3. Residential land uses
4. Transportation corridors
5. Hazardous materials storage and use
6. Superfund and Oil or hazardous material contamination sites
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead except for Pumping Station #1, which has a 250 foot radius around each of the 4 wells in the wellfield. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Not all of the Zone I areas are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Pumping Station #1: 4036000-01G – County Road intersects the 250 foot Zone I for the wellfield.

Zone I: Well#2: 4036000-02G – Route 28A intersects the Zone I on the western side of Rt. 28A and the Zone I is not under the control of the Bourne Water District. An underground storage tank is located in this portion of the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

2. Automotive Junkyard/Salvage Operations— Damaged autos are being

stored at an unpermitted facility within the Zone II. Spills, leaks, or improper handling of automotive chemicals, wastes, and batteries can potentially contaminate the water supply.

Automotive Junkyard/Salvage Recommendations:

- ✓ Work with the Town to bring facility into compliance with local and state regulations.
- ✓ Notify the junkyard that part of the facility is located in a public water supply protection area.
- ✓ Work with junkyard owner to be sure that best management practices are used for proper handling of materials and in containing spills and leaks.

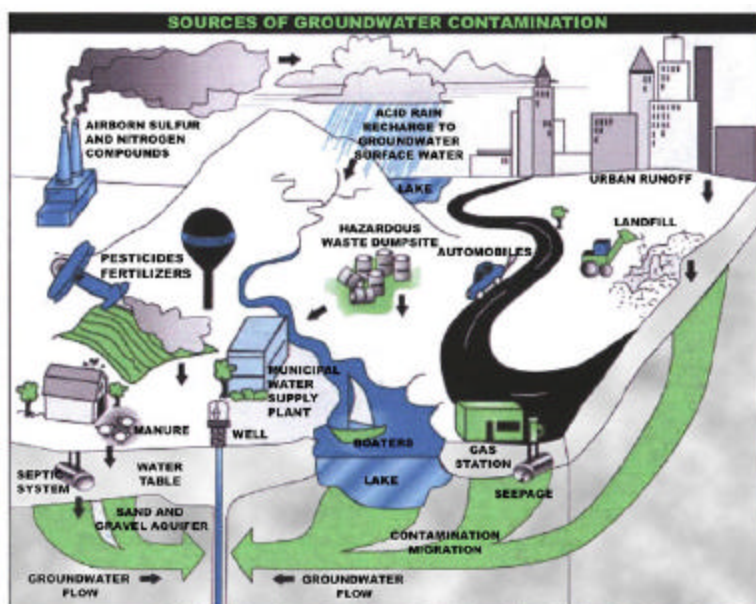
3. Residential Land Uses – Portions of the Zone II west of Route 28 consist of

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

4. Transportation Corridors - Route 28 runs through the Zone II just south of the wells. Local roads are common throughout the Zone II. Roadway

construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

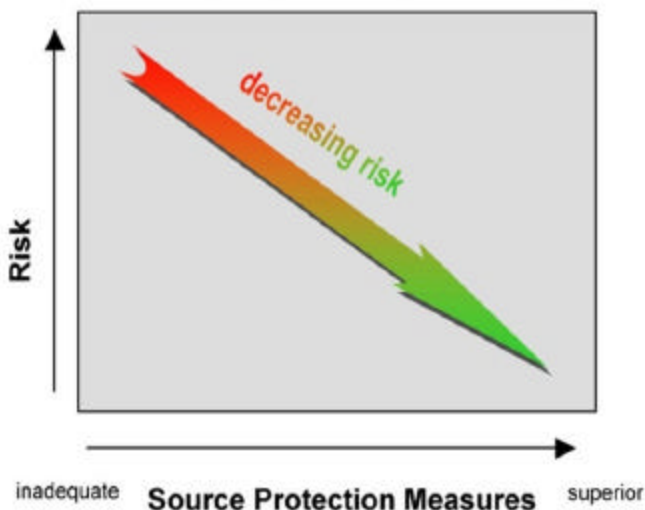


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	1	M	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	Pesticides: leaks, spills, improper handling, or over-application
Commercial			
Car/Truck/Bus Washes	2	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Auto Repair Shops	5	H	Automotive fluids, vehicle paints, and solvents: spills, leaks, or improper handling
Boat Yards/Builders	3	H	Fuels, paints, and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	Fuels and maintenance chemicals: spills, leaks, or improper handling
Dry Cleaners	1	H	Solvents and wastes: spills, leaks, or improper handling
Furniture Stripping and Refinishing	2	H	Hazardous chemicals: spills, leaks, or improper handling
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Junk Yards and Salvage Yards	1	H	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Industrial			
Asphalt, Coal Tar, And Concrete Plants	1	M	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Fuel Oil Distributors	1	H	Fuel oil: spills, leaks, or improper handling or storage
Hazardous Materials Storage	Several	H	Hazardous materials: spills, leaks, or improper handling or storage
Industry/Industrial Parks	1	H	Industrial chemicals and metals: spills, leaks, or improper handling or storage

Table 2 (Continued): Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Residential			
Fuel Oil Storage (at residences)	Many	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Many	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Many	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Clandestine Dumping	sporadic	H	Debris containing hazardous materials or wastes
Landfills and Dumps	1	H	Seepage of leachate
Military Facilities : Massachusetts Military Reservation	1	H	Pesticides and herbicides, fuel, chemicals and other materials: spills, leaks, or improper handling or storage; may include ordnance or waste landfill/dump sites
Oil or Hazardous Material Sites	5	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Transmission Line Rights-of-Way	1	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Many	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	3	H	Stored materials: spills, leaks, or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

- ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

5. Hazardous Materials Storage and Use – Portions of the Zone II along Routes 28 & 28A contain commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

6. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000031, 4-0000039, 4-0000649, 4-0000657 & 4-00015031. Refer to the attached map and Appendix 3 for more information.

Bourne Water District should continue to monitor activities at the federally classified superfund site at Massachusetts Military Reservation (MMR), which

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



encompasses part of their Zone II. More information can be viewed at <http://www.epa.gov/superfund/index.htm>.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites and superfund site.

7. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

The portion of the Zone II located within MMR is permanently protected by the Environmental Commission and meets DEP's wellhead protection requirements. This protects the Zone II from future threatening land uses and requires strict clean-up standards for existing contamination.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan for the Bourne Water District. Establish a protection team with members from the water districts in Bourne, town

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

officials, MMR officials and other interested parties. Refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".

- ✓ Ensure that the Town of Bourne's wellhead protection controls are current and meet MA Wellhead Protection Regulations 310 CMR 22.21(2). Look at the Town's overlay district map to ensure that it includes all the DEP approved Zone IIs within the Town. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

Refer to Table 2 and Appendix A & B for more information about other land uses of concern.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Monitoring activities in the Zone II with the potential to threaten water quality and providing this information to local authorities for the appropriate follow up action.
- Taking an active role in the cleanup effort being undertaken at the Massachusetts Military Reservation.
- Meeting DEP's best effort requirements for wellhead protection and successfully influencing the Town to adopt wellhead protection controls for all the water districts in town.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Work with local and state officials to ensure that automotive salvage and junkyards are properly permitted and are operating using BMPs that guarantee automotive fluids are not entering the aquifer.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ Continue to monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A:

REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
29373	Datamarine Intl. Inc.	53 Portside Dr.	Bourne	Generator of Hazardous Waste	Very Small Quantity Generator	Marine Services
31975	Wenzels Auto Body Inc.	26 Commercial Park Rd.	Bourne	Generator of Hazardous Waste	Very Small Quantity Generator	Auto Repair
33136	Verizon New England Inc.	5 Commerce Park Rd.	Bourne	Generator of Hazardous Waste	Very Small Quantity Generator	Communications
33615	Atlantic Resorations	22 Commerce Park Rd.	Bourne	Generator of Hazardous Waste	Very Small Quantity Generator	
36817	Handy Andy's Repair	11 Commerce Park Rd.	Bourne	Generator of Hazardous Waste	Very Small Quantity Generator	
39100	Otis Airforce Base Landfill	Connery Rd	Bourne	Landfill	Closed Landfill	Landfill
131573	Pocasset Truck and Auto Repair	11 Commerce Park Rd.	Pocasset	Generator of Hazardous Waste	Very Small Quantity Generator	Vehicle Repair
134302	Pocasset Machine Corp.	7 Commerce Park Rd.	Pocasset	Generator of Hazardous Waste	Very Small Quantity Generator	
134303	Towers Service Center	606 Macarthur Blvd. Rt. 28	Pocasset	Generator of Hazardous Waste	Very Small Quantity Generator	
274908	Wing Custom Cabinets	Commerce Park Rd.	Buzzards Bay	Plant	Air Quality Permit	Furniture Manufacture
274909	Sapphire Engineering Inc.	53C Portside Dr.	Buzzards Bay	Generator of Hazardous Waste	Large Quantity Generator	
319341	Creative Creamery	8 Otis Park Dr.	Bourne	Plant	Air Quality Permit	

APPENDIX A Continued:
REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
HANDY CRANBERRY TRUST ID #19030	1318 COUNTY RD	CATAUMET, MA, 02534	Gas Station	1 Wall	Approved In-Tank Monitor	2000	Gasoline
CATAUMENT BOATS INC ID #10210	1280 ROUTE 28A	CATAUMET, MA, 02534	Motor Vehicle Refueling	2 Walls		4000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000031	MA MILITARY RESERVATION	BOURNE	Hazardous Materials
4-0000039	HERBERT RD	BOURNE	Hazardous Materials
4-0000649	CONNERY AVE	BOURNE	Oil
4-0000657	FRANK PERKINS RD	BOURNE	Oil
4-0001256	ARTILLERY FIRING POINTS	BOURNE	Hazardous Materials

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Buzzards Bay Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Buzzards Bay Water District
<i>PWS Address</i>	P.O. Box 243, 15 Wallace Avenue
<i>City/Town</i>	Buzzards Bay, MA 02532
<i>PWS ID Number</i>	4036001
<i>Local Contact</i>	William R. Chapman, Superintendent
<i>Phone Number</i>	508-759-4631

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 189

Susceptibility: Medium

Well Names	Source IDs
Well #1	4036001-01G

Zone II #: 190

Susceptibility: High

Well Names	Source IDs
Well #2	4036001-02G

Zone II #: 191

Susceptibility: High

Well Names	Source IDs
Well #3	4036001-03G
Well #4	4036001-04G

The Buzzards Bay Water District has four gravel-packed wells located within the Plymouth/Carver aquifer. The wells are located in three Zone IIs. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

The wells are treated with potassium hydroxide to control corrosion. For current information on treatment and the results of water quality monitoring, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs contain predominantly undeveloped forest and a mix of residential homes, agriculture and recreation (refer to attached map for details). Ten percent (10%), 8% and 5% of Zone IIs #189, 190 and 191, respectively, are comprised of open space. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Transportation Corridors
4. Transmission Line Right-of-Way
5. Agriculture
6. Nursing Home
7. Golf Course
8. Clandestine Dumping
9. DEP Tier Classified Oil or Hazardous Material Release Site

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Land Uses Within Zone I – The Zone I for each of the wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) requires public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells.

Zone I for 01G: Bournedale Road passes through the Zone I and some land is owned by the Wildlands Trust of Southeastern Massachusetts. This property is fenced and undisturbed.

Zone I for 02G: entirely owned or controlled by water district

Zone I for 03G: entirely owned or controlled by water district

Zone I for 04G: a small portion of Bournedale Road passes through the Zone I.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 2%, 7% and 7% of Zone IIs #189, 190 and 191, respectively, consist of residential land uses. The Zone IIs also contain 80%, 59% and 71% forested, undeveloped land. Significant portions of the Zone IIs have the potential for more residential development. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

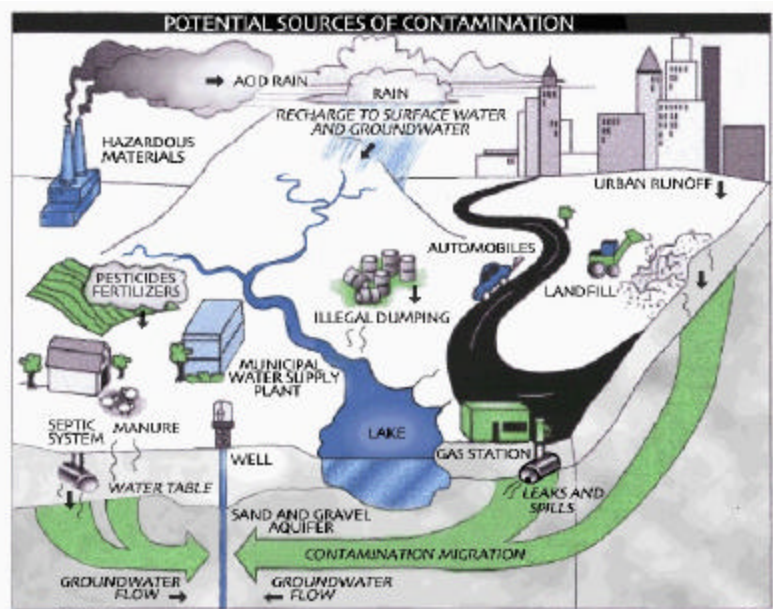
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas. See www.state.ma.us/envir/ to obtain information from the Massachusetts Executive Office of Environmental Affairs on build-out analyses for communities into which Zone IIs extend.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 25 runs through the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained,

and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Transmission Lines - There is a gas main within the Zone II for well #2 and electric lines within the Zone IIs for wells #1, 3 & 4.

These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

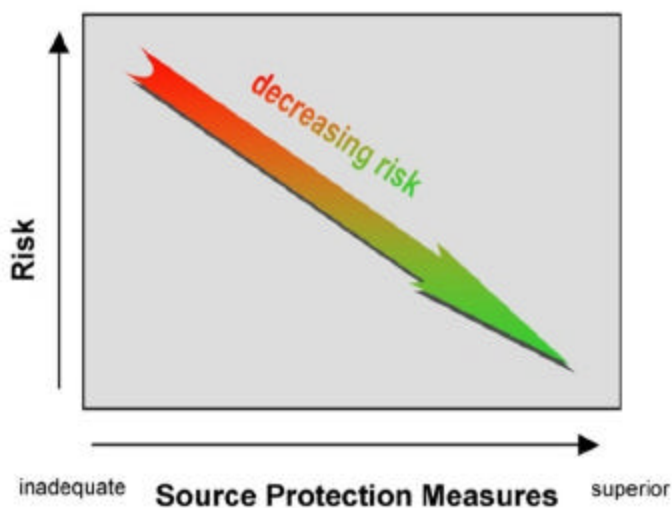


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential			
Septic Systems	3+ in each Zone II	M	microbial contaminants, improper disposal of hazardous chemicals
Fuel Oil Storage	3+ in each Zone II	M	spills, leaks or improper handling of fuel oil
Lawn Care	3+ in each Zone II	M	over-application of improper storage and disposal of pesticides
Agriculture			
Agriculture - Livestock Operations/Manure Storage or Spreading	1 horse farm in 190; 1 pig farm in 191	H	microbial contamination from improper handling or storage of manure
Commercial			
Nursing Home	1 in 190	L	microbial contaminants from improper management of septic systems
Golf Course	1 in Plymouth in 191	M	over-application or improper handling of pesticides and fertilizers
Miscellaneous			
Transportation Corridors are within Zone I for wells 01G and 04G & within the Zone IIs	local roads + Route 25	M	leaks or spills of fuel and other hazardous materials; over-application or improper handling of pesticides; erosion from construction
Transmission Line Right-of-Way	4 total - 1 gas main in 190; 3 electric lines in 189 & 191	L	spills from over-application or improper handling of pesticides, erosion from construction
Clandestine Dumping	in 190	H	debris containing hazardous materials or wastes
DEP Tier Classified Oil/Hazardous Material Release Site	1 in 189	not ranked	see Appendix A for more information

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix A: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

Transmission (Utility) Lines Recommendations:

- ✓ Monitor the YOP for pesticide application.

5. Agricultural Activities – A pig farm, a horse farm, backyard animals and croplands are found in the Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Nursing Home - There is one nursing home within Zone II #190 (well #2). In some cases, concerns may exist about the operation of older septic systems serving large numbers of people. There is no evidence that this system is malfunctioning.

Nursing Home Recommendation:

- ✓ Distribute a flyer to the nursing home describing proper maintenance of septic systems.

7. Golf Course - There is one golf course in Plymouth within Zone II #191 (wells #3 & 4). Potential over-application and spills of pesticides and fertilizers is a concern.

Golf Course Recommendation:

- ✓ Work with the owner/operator of the golf course to ensure spill containment and to minimize the use of pesticides and fertilizers within the Zone II.

8. Clandestine (Illegal) Dumping - Illegal dumping of solid waste is often a problem on undeveloped lands. Sometimes this debris contains hazardous materials or wastes. Illegal dumping occurs within Zone II #190 (well #2).

Clandestine Dumping Recommendations:

- ✓ Educate the public about the contamination threats associated with illegal dumping.
- ✓ Work with local towns to conduct household hazardous waste collection days.
- ✓ Maintain a presence in the watershed and work with local police to discourage illegal dumping.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	No 01G;04G; Yes 02G, 03G	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES Plymouth	Continue to work with Plymouth regarding wellhead protection.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Conduct drills with local emergency planning committee to test procedures.
Does the municipality have a wellhead protection committee?	NOT A FORMAL COMM.	Police Dept. works with the Water District to protect water sources.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Also may hire contractor to conduct cross-connection inspections.
Does the PWS provide wellhead protection education?	YES	Included section on security measures in the Consumer Confidence Report (CCR).

9. **DEP Tier Classified Oil or Hazardous Material Release Site** - There is a hazardous materials release site within Zone II #189 (well #1). Refer to the attached GIS map and Appendix A for more information.

Release Site Recommendation

- ✓ Follow the progress of site clean-up.

Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – Currently, the Town does not have water supply protection controls that meet DEP’s Wellhead Protection regulations, 310 CMR 22.21(2). Local bylaws or regulations should be updated to meet the land use controls that are outlined in the regulations.

A local Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations, 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- ? working with the towns of Bourne and Plymouth to protect the public wells;
- ? conducting Board of Health inspections of commercial and industrial facilities;
- ? conducting public outreach efforts; and
- ? working with the Police Department on protection issues.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix B.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- B. Additional Documents on Source Protection

APPENDIX A – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
40000408	195 Bournedale Road	Bourne	hazardous material

For more location information, please see the attached map. The map lists the release sites by RTN.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

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RTN	Release Site Address	Town	Contaminant Type
4-0000408	195 BOURNE DALE RD	BOURNE	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
North Sagamore Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	North Sagamore Water District
<i>PWS Address</i>	14 Squanto Road
<i>City/Town</i>	Bourne, MA 02532
<i>PWS ID Number</i>	4036002
<i>Local Contact</i>	Paul Gibbs
<i>Phone Number</i>	508-888-1085

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 417

Susceptibility: High

Well Names	Source IDs
Beach well (GP Well #1)	4036002-01G

Zone II #: 418

Susceptibility: High

Well Names	Source IDs
Black Pond Well	4036002-03G

The North Sagamore Water District has two active gravel-packed wells, the Black Pond well (the primary source of water) and the Beach well. A third well, the Church Lane well is awaiting the design and construction of a treatment plant for iron and manganese removal. Each well has a Zone I of 400 feet and a Zone II that has been hydrogeologically determined. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zones I and II.

The wells are treated with potassium hydroxide to control corrosion. For current information on treatment and the results of water quality monitoring, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs contain predominantly undeveloped forest, 59% of the Zone II for the Black Pond well and 40% of the Zone II of the Beach well. The Zone II for the Black Pond well extends into Plymouth. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Service Station/Auto. Repair Shop
4. Transportation Corridors
5. Transmission Line Right-of-Way
6. Clandestine Dumping
7. Aquatic Wildlife
8. Baseball Field

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Land Uses Within Zone I – The Zone I for each of the wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) requires public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells.

Black Pond well (03G): Black Pond Road passes through the Zone I
Beach well (01G): Pilgrim Road passes through the edge of the Zone I

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 37% and 23% of Zone IIs #417 and #418, respectively, consist of residential land uses. The Zone IIs also contain 40% and 59% forested, undeveloped land. Some portions of the Zone IIs have the potential for more residential development. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

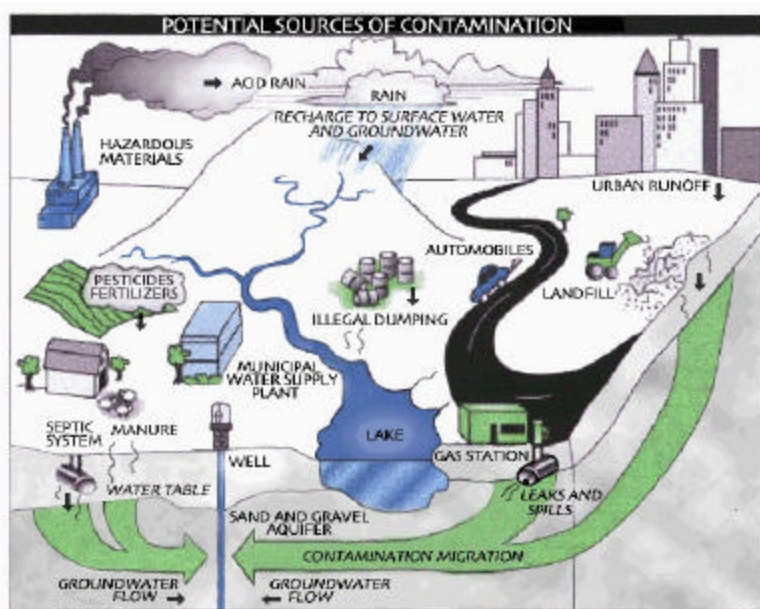
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas. See www.state.ma.us/envir/ to obtain information from the Massachusetts Executive Office of Environmental Affairs on build-out analyses for communities into which Zone IIs extend.
- ✓ Promote Best Management Practices (BMPs) for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Service Station/Auto. Repair Shop - There is one service station/auto. repair shop within the Zone II of the Beach well. Automotive fluids and solvents can leak or spill from this type of facility.

Service Station/Auto. Repair Shop Recommendations:

- ✓ Talk with the owner/operator about BMPs for storing, handling and disposing of fluids and solvents.

4. Transportation Corridors - Route 3 runs through the Zone II for the Beach well. Local roads run through both Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage systems along transportation corridors. Wherever possible, ensure that drains discharge to outside the Zones I & II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zones I & II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

5. Transmission Line - There is an electric utility line that runs through the Zone IIs.

For More Information

Contact Isabel Collins in DEP’s Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

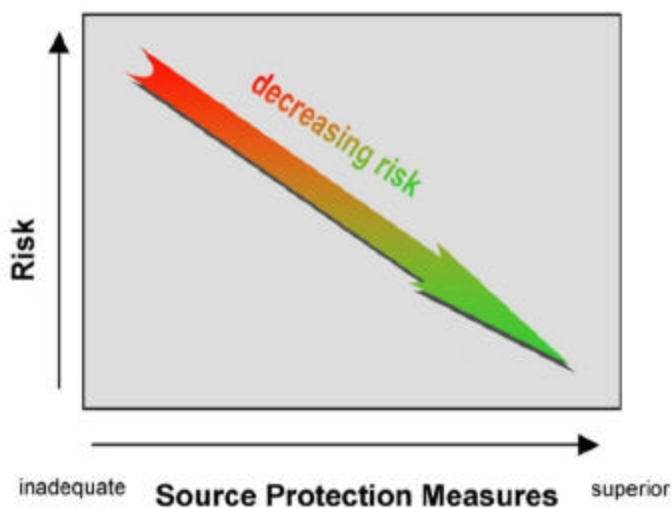


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

(Continued on page 6)

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential (Zone IIs 417 & 418)			
Septic Systems	3+ in each Zone II	M	microbial contaminants, improper disposal of hazardous chemicals
Fuel Oil Storage	3+ in each Zone II	M	spills, leaks or improper handling of fuel oil
Lawn Care	3+ in each Zone II	M	over-application of improper storage and disposal of pesticides
Commercial (Zone II 417)			
Service Station/Auto. Repair Shop	1	H	leaks or spills of automotive fluids and solvents
Miscellaneous			
Transportation Corridors are within Zone I for well 01G & within both Zone IIs (417 & 418)	local roads; Route 3 (417)	M	leaks or spills of fuel and other hazardous materials; over-application or improper handling of pesticides; erosion from construction
Transmission Line Right-of-Way (Zone IIs 417 & 418)	1 electric	L	spills from over-application or improper handling of pesticides, erosion from construction
Clandestine Dumping (Zone II 418)	sometimes	H	debris containing hazardous materials or wastes
Aquatic Wildlife (Zone II 418)	on Black Pond	L	microbial
Recreation (Zone II 417)	1 baseball field	M	runoff and spills from fertilizer use or storage

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Transmission lines are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

Transmission (Utility) Lines Recommendations:

- ✓ Monitor the YOP for pesticide application.

- 6. Clandestine (Illegal) Dumping** - Illegal dumping of solid waste is often a problem on undeveloped lands. Sometimes this debris contains hazardous materials or wastes. Illegal dumping occurs sometimes within the Zone II of the Black Pond well.

Clandestine Dumping Recommendations:

- ✓ Educate the public about the contamination threats associated with illegal dumping.
- ✓ Work with local towns to conduct household hazardous waste collection days.
- ✓ Maintain a presence in the watershed and work with local police to discourage illegal dumping.

- 7. Aquatic Wildlife** - There is aquatic wildlife on Black Pond.

Aquatic Wildlife Recommendations:

- ✓ Discourage feeding of the waterfowl.
- ✓ Post signs denoting the drinking water supply protection area.

- 8. Recreation** - There is a baseball field within the Zone II of the Beach well. Fertilizer use and storage may be associated with athletic fields.

Recreation Recommendation:

- ✓ Work with the Town to reduce fertilizer use and properly store materials.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – Currently, the Town of Bourne has a water supply protection bylaw that meets DEP's Wellhead Protection regulations, 310 CMR 22.21(2). The North Sagamore Water District needs to demonstrate to DEP that the Town's Water Resource Protection District protects the Zone IIs for the District's wells. In addition, the District needs to make a best effort to have Bourne adopt a non-zoning floor drain control that is consistent with 310 CMR 22.21(2)(a)(8).

A local Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	Yes Bourne	The Town “Aquifer Protection District” bylaw meets DEP’s requirements for wellhead protection. The District needs to show DEP that the bylaw covers the Black Pond and Beach wells, too, or make a best effort to have them covered. A floor drain control should also be passed.
Do neighboring communities protect the Zone II areas extending into their communities?	YES Plymouth	Continue to work with Plymouth regarding wellhead protection.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Work with other local water systems to develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Conduct drills with local emergency planning committee to test procedures.
Does the municipality have a wellhead protection committee?	NO	A committee can be helpful with implementing wellhead protection measures.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Commercial - no industrial present.
Does the PWS provide wellhead protection education?	YES	Talks at elementary school and distribution of CCR.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Provide documentation to DEP that the Town of Bourne's Water Resource Protection District protects the District's wells, also, or make a best effort to have Bourne include them in the bylaw.
- ✓ Make a best effort to have Bourne pass a floor drain regulation that is consistent with 310 CMR 22.21(2)(a)(8).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection:

As with many water supply protection areas, this system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- ? working with the towns of Bourne and Plymouth to protect the public wells;
- ? conducting Board of Health inspections of commercial facilities;
- ? conducting public outreach efforts; and
- ? purchasing land for water supply protection.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zones I & II and to cooperate on responding to spills or accidents.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendix**A. Source Protection Fact Sheets**



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Cape Cod Air Force Station

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Cape Cod Air Force Station
PWS Address	Massachusetts Military Reservation
City/Town	Bourne
PWS ID Number	4036008
Local Contact	Stephanie Syler
Phone Number	(508) 968-3321

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4036008-01G	400	2320	High
Well #2	4036008-02G	400	2320	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

The Cape Cod Air Force Station has two groundwater wells that provide drinking water to the facility. Well #1 is located adjacent to the facility and serves as a back-up water source. Well #2 acts as the primary source and is located in the woods north of the facility and is secured by a chain link fence. Both wells have Zone I radii of 400 feet and Interim Wellhead Protection Area (IWPAs) radii of 2320 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

migration. Please refer to the attached map of the Zone Is and IWPA's.

The wells serving the facility are disinfected with chlorine at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Non-Water Supply Activities in Zone I;**
2. **Above Ground Storage Tanks (ASTs);**
3. **Septic System, and**
4. **Road and Vehicle Parking.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of high ranked threats within the Zone I and IWPA.

1. **Non-Water Supply Activities in Zone I** – Currently, Well #1 does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The Zone I for Well #1 contains facility buildings that includes above ground storage tanks with diesel fuel. The Zone I for Well #2 meets DEP's Zone I requirements. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Ensure all above ground storage tanks and piping is properly contained and monitored for leaks.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Hazardous waste storage (waste oil)	No	Yes Wells #1 and 2	High	Mishandling spills and leaks
Above ground storage tanks (eight)	Yes Well #1	Yes Wells #1 and 2	Moderate	Potential for leaks and spills. Please note that all tanks are double walled or vaulted.
Septic system	Yes Well #1	Yes Wells #1 and 2	Moderate	Bacteria, improper disposal of hazardous materials
Parking lot	No	Yes Wells #1 and 2	Moderate	Stormwater runoff, spills
Road	No	Yes Wells #1 and 2	Moderate	Stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Aboveground Storage Tank (AST)** – There are ASTs with containment located within the IWPAs and Zone I for Well #1. Seven tanks hold dielsel fuel and one contains waste oil (hazardous waste). If managed improperly, above ground storage tanks can be a potential source contamination due to leaks or spills of the chemicals they store. An inventory of the ASTs is kept by the Air Force.

Recommendations:

- ✓ Inspect and maintain the integrity of the containment structure.
- ✓ Monitor for leaks.
- ✓ Ensure BMPs are in place to avoid spills during fill-up or transfer of contents.

3. **Septic System** – The septic system for the facility is located within the Zone I for Well#1.

Recommendation:

- ✓ Septic system components should be inspected and maintained on a regular basis.

4. **Road and Vehicle Parking**– Part of a road and vehicle parking is within the the IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Ensure runoff is directed away from the wells.
- ✓ Include spill containment and drainage mapping as part of your emergency plan.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Cape Cod Air Force Station is commended for constructing containment for their above ground tanks. Officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Consider well relocation for Well #1.

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Post water supply protections signs in the Zone I and IWPA.
- ✓ Continue to conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.

Facilities Management:

- ✓ Inspect and maintain the integrity of the containment structure for the AST. Monitor for leaks.

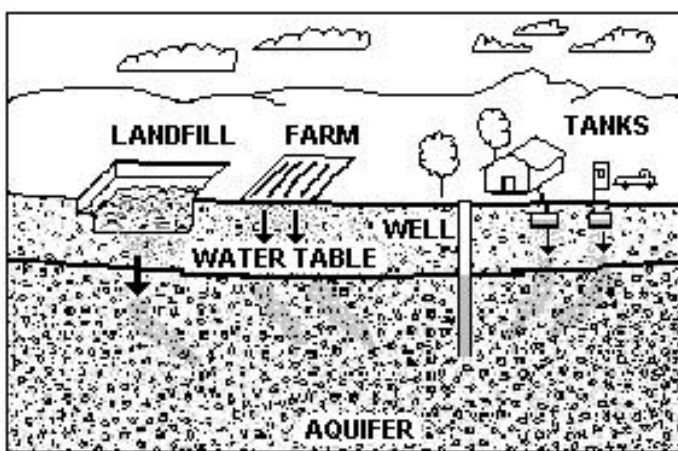


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Officials should use this SWAP report to spur discussion of drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Schooner Pass Trustees Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
December 10, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Schooner Pass Trustees Condominiums
PWS Address	Sandwich Road
City/Town	Bourne, Massachusetts
PWS ID Number	4036011
Local Contact	Robert Smith
Phone Number	(508) 759-9020

Groundwater Sources:

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4036011-01G	300	879	Moderate

Purchased Sources

Supplier Name	Purchase ID#
Bourne Water District	4036011-01P

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The drinking water supply well for Schooner Pass Trustees Condominiums is located southeast of the condominium development in the Town of Bourne. Well No. 1 has a Zone I radius of 300 feet and an Interim Wellhead Protection Area (IWPA) radius 879 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Please refer to the attached map to view the boundaries of the Zone I and IWPA.

Water from the well is not treated before entering the distribution system. For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Schooner Pass Trustees Condominiums also purchases some of its water from Bourne Water District. Please see the attached SWAP report for this purchased source provider.

Section 2: Land Uses in the Protection Areas

The land uses in the IWPA for Well No. 1 are mostly residential and athletic fields for a nearby school (refer to attached map for details). Much of the IWPA area is forested. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Zone I
2. Residential Land Uses
3. Athletic Fields
4. Presence of Oil or Hazardous Material Contamination Site

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I – The Zone I for Well No. 1 is a circular area with a 300-foot radius that is centered at the wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. The Zone I for Well No. 1 is controlled by the public water system through a lifetime lease of the property. Non-water-supply uses are not allowed within the Zone I.

Zone I Recommendations:

- ✓ Continue to prevent non-water supply activities/uses from occurring within the Zone I area.

2. Residential Land Uses – A portion of the IWPA area consists of residential land use. None of the areas have public sewers, therefore, all use on-site septic systems. If managed improperly, activities associated with residential areas can contribute to

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Athletic Fields	No	Yes	Moderate	Fertilizer and pesticide use
Residential – Septic Systems	No	Yes	Moderate	Educate residents on proper septic system operation and maintenance.
Residential – Lawn Care	No	Yes	Moderate	Educate residents on proper lawn care techniques.

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination. Fortunately, the septic systems within the IWPA are reportedly pumped out once every three years.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Fuel oil storage reportedly does not occur within the IWPA.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Fortunately, stormwater drains within the IWPA reportedly discharge outside the IWPA.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in the attachments and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at mass.gov/dep/brp/wm/nonpoint.htm.

3. Athletic Fields – The pesticides and fertilizers used for lawn care can be transported from the ground surface down into the aquifer with storm water and excess irrigation water. The over-application or improper storage and disposal of pesticides and fertilizers could result in contamination of the aquifer.

Recommendation:

- ✓ Inform the nearby school about the areas that are located within the IWPA of the

public water supply well and request that they use proper application procedures for, and minimize the use of, pesticides and fertilizers in those areas that are within the IWPA.

4. Presence of Oil or Hazardous Material Contamination Sites

– Based upon a DEP web site database query (<http://www.state.ma.us/dep/bwsc/sitelist.htm>), the IWPA area does not contain any Oil and/or Hazardous Material Release Sites. However, the IWPA abuts Massachusetts Military Reservation to the east which has multiple DEP Bureau of Waste Site Cleanup (BWSC) Release Tracking Numbers (RTNs) associated with it.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil release sites that are in the vicinity of the IWPA.

Refer to Table 2 for a complete list of land uses. Identifying

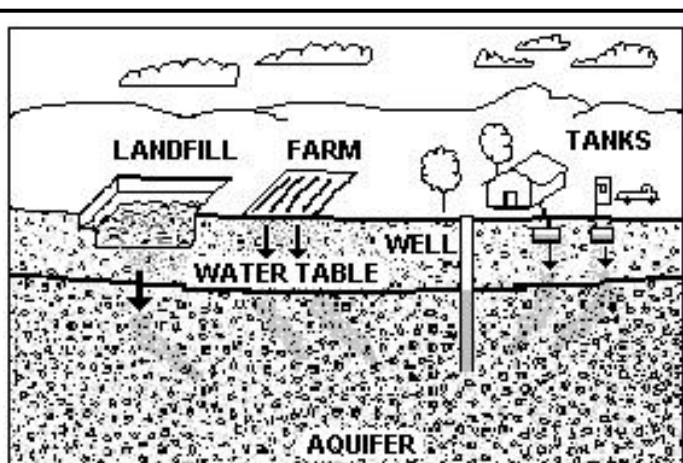


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Schooner Pass Trustees Condominiums is commended for current protection measures including:

- Effectively controlling the Zone I area so that non-water supply activities are excluded from the Zone I.
- Having a formal Emergency Response Plan for dealing with oil/hazardous material spills or other emergencies.
- Providing wellhead protection education material to the residents within the IWPA.

Schooner Pass Trustees Condominiums should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Continue to prevent non-water supply activities from occurring within the Zone I.

Planning:

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- SWAP Report for Bourne Water District
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Tri Town Water Board

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Tri Town Water Board
<i>PWS Address</i>	2 J.F.K. Memorial Drive/P.O. Box 903
<i>City/Town</i>	Braintree, Massachusetts 02184
<i>PWS ID Number</i>	3040002
<i>Local Contact</i>	Paul Wohler
<i>Phone Number</i>	(781) 794-8250

Introduction

We are all concerned about the quality of the water we drink. Drinking water may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

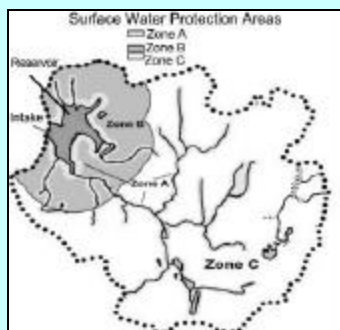
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Section 1: Description of the Water System

Source Name	Source ID	Susceptibility
Great Pond	3040002-01S	High
	3040000-01S	High
	3244001-01S	High
Richardi Reservoir	3040000-02S	High
Farm River	3040000-03S	High
Upper Reservoir—Great Pond	3040000-04S	High

The Tri Town Water Board (Board) maintains and operates four public water supply sources that serve the towns of Braintree, Holbrook, and Randolph. The Board's sources are located within the Weymouth/Weir River basin. The watershed for Great Pond extends from Braintree and Randolph south into the towns of Avon and Stoughton; Richardi Reservoir's watershed includes areas of Braintree and Randolph; and, the Farm River watershed extends from Braintree and Randolph into Quincy, Milton and Canton.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The protection areas for the Board's water supply sources are a mixture of forest, residential, commercial, and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2.

Glossary Protection Zones

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Transportation Corridors
3. Hazardous Materials Storage and Use
4. Residential Land Uses
5. Golf Course
6. Presence of Oil or Hazardous Material Contamination Sites
7. Aquatic Wildlife
8. Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone A Land Uses - The Zone A is the land area within 400 feet of a reservoir and 200 feet of its tributaries. The land uses and activities within the Zone A areas for the Board include: transportation corridors, commercial and industrial facilities, recreational activities, and aquatic wildlife. Public water systems are responsible for enforcing the prohibition of certain new or expanded land uses within the Zone A, as detailed in 310 CMR 22.20(b).

Zone A Recommendations:

- ✓ Actively monitor new or expanded land uses within the Zone A according to your watershed protocol submitted to DEP.
- ✓ To the extent possible, remove all activities from the Zone As to comply with DEP's Zone A requirements.
- ✓ Control stormwater and erosion within the Zone A.
- ✓ Control aquatic wildlife within the Zone A as necessary.
- ✓ Work with local emergency response teams to practice containment of spills within the Zone A.
- ✓ Conduct regular inspections of the Zone A for illegal dumping and spills.
- ✓ Install water supply protection area signs as needed around the Zone A.

2. Transportation Corridors - Transportation corridors and other paved and unpaved local roads cross through the water supply protection areas. Spills from vehicular accidents are a major concern. In addition, roadway construction, maintenance, and typical highway use can all be potential sources of contamination.

Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations:

- ✓ Continue to work cooperatively with the Massachusetts Highway Department on a hazardous materials management plan.
 - ✓ Work with the Towns and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
 - ✓ Continue to work with local emergency response teams to ensure that any spills within the watersheds can be effectively contained.
-
- ✓ Review storm drainage maps with emergency response teams. Work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

3. Hazardous Materials Storage and Use – Approximately eleven (11) percent of the combined area within the watersheds is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.

4. Residential Land Uses – Approximately 40% of the watersheds consist of residential areas. Most of the areas have public sewers, with the remainder using private septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

- **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Residential Land Use Recommendations:

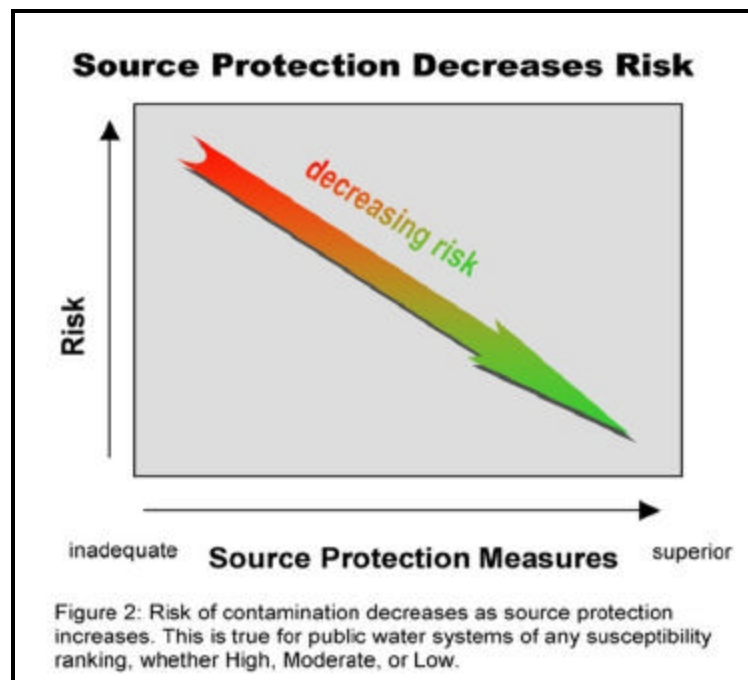
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.

- ✓ Promote BMPs for stormwater management and pollution controls.

5. Golf Course Activities – Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Golf Courses Recommendations:

- ✓ Encourage the golf course grounds manager to incorporate an **Integrated Pest Management (IPM)** approach into their grounds maintenance program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.



Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watersheds

Activities	Quantity	Threat	Source #	Potential Source of Contamination
Agricultural				
Livestock Operations	2	H	01S, 03S, 04S	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	3	H	01S, 03S, 04S	Manure (microbial contaminants): improper handling
Nurseries	1	M	03S	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Commercial				
Body Shops	6	H	01S, 03S, 04S	Improper management of vehicle paints, solvents, and primer products
Car/Truck/Bus Washes	1	L	01S, 04S	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	4	H	01S, 03S, 04S	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	12	H	01S, 02S, 03S, 04S	Automotive fluids, vehicle paints and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	6	H	01S, 03S, 04S	Fuels and maintenance chemicals: spills, leaks, or improper handling
Cemeteries	3	M	01S, 03S, 04S	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids (such as arsenic)
Golf Courses	2	M	02S, 03S	Fertilizers or pesticides: over-application or improper handling
Medical Facilities	1	M	02S	Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes
Nursing Homes	3	L	01S, 04S	Microbial contaminants
Paint Shops	1	H	03S	Spills, leaks, or improper handling or storage of paints, solvents, other chemicals
Photo Processors	2	H	01S, 03S, 04S	Spills, leaks, or improper handling or storage of photographic chemicals
Printer and Blueprint Shops	4	M	01S, 03S, 04S	Printing inks and chemicals: spills, leaks, or improper handling or storage

Table 2: Land Use in the Watersheds

Activities	Quantity	Threat	Source #	Potential Source of Contamination
Commercial (cont'd)				
Repair Shops (Engine, Appliances)	1	M	03S	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Research Laboratories	3	M	01S, 03S, 04S	Laboratory chemicals and wastes: spills, leaks, or improper handling or storage
Sand and Gravel Mining/Washing	1	M	03S	Spills or leaks from heavy equipment, fuel storage, clandestine dumping
Industrial				
Asphalt, Coal Tar, and Concrete Plants	1	M	01S, 04S	Spills, leaks, or improper handling or storage of hazardous chemicals and wastes
Food Processors	3	L	01S, 03S, 04S	Spills, leaks, or improper handling or storage of cleaners and other chemicals; microbial contaminants
Hazardous Materials Storage	4	H	01S, 03S, 04S	Spills, leaks, or improper handling or storage of hazardous materials
Industry/Industrial Parks	6	H	01S, 03S, 04S	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	H	03S	Spills, leaks, or improper handling of solvents; metal tailings
Pharmaceutical Manufacturers	1	H	01S, 04S	Spills, leaks, or improper handling and or storage of chemicals
Plastic Manufacturers	1	H	03S	Spills, leaks, or improper handling or storage of solvents, resins and process wastes
Residential				
Fuel Oil Storage (at residences)	100+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care/ Gardening	100+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems/ Cesspools	Several	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	6	M	01S, 03S, 04S	Spills, leaks, or improper handling of materials stored in tanks
Aquatic Wildlife	100+	L	All	Microbial contaminants
Clandestine Dumping	Frequent	H	01S, 03S, 04S	Debris containing hazardous materials or wastes
Composting Facilities	2	L	01S, 03S, 04S	Storage and improper handling of organic material, animal waste, and runoff

Table 2: Land Use in the Watersheds

Activities	Quantity	Threat	Source #	Potential Source of Contamination
Miscellaneous				
Large Quantity Hazardous Waste Generators	6	H	01S, 03S, 04S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Military Facilities (Past And Present) Type: <u>former NIKE site</u>	1	H	03S	Spills, leaks, or improper handling or storage of pesticides and herbicides, fuel, chemicals and other materials; may include ordnance or waste landfill/dump sites
NPDES Locations	1	L	01S, 04S	Improper disposal of hazardous material and wastes
Oil or Hazardous Material Sites	7	--	01S, 03S, 04S	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	6	M	01S, 03S, 04S	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small Quantity Hazardous Waste Generators	28	M	01S, 04S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	100+/ Few	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	4	H	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks		M	01S, 03S, 04S	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generators	40	L	01S, 03S, 04S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Water Treatment Sludge Lagoons	4	M	01S, 04S	Improper management of sludge and wastewater
Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

- ✓ Promote **Best Management Practices** (BMPs) for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Work with golf courses to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.

6. Presence of Oil or Hazardous Material Contamination Sites – The watersheds contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the maps as Release Tracking Numbers 3-0016811, 3-0004029, 3-0003431, 3-0001524, 3-0021031, 3-0019730, and 4-0010012. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

7. Aquatic Wildlife - Birds, particularly gulls, are attracted to large open bodies of water. Birds may increase coliform levels through the release of fecal matter into the water and may carry other bacteria and viruses. Beaver and muskrat may introduce the pathogens Giardia and Cryptosporidium into water through fecal matter. Because of their constant contact with the water, these aquatic mammals represent a

potential threat to drinking water reservoirs. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

Aquatic Wildlife Recommendations:

- ✓ Monitor wildlife populations in and around reservoirs.
- ✓ Where necessary, discourage and control aquatic wildlife. See <http://mass.gov/dep/brp/dws/protect.htm> for guidance and permits.

8. Protection Planning - Protection planning protects drinking water by managing the land area that supplies water to a reservoir. Currently, the watershed towns do not have water supply protection controls that meet DEP's Surface Water Protection regulations 310 CMR 22.20 (b) and (c). A Surface Water Supply Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply reservoirs.

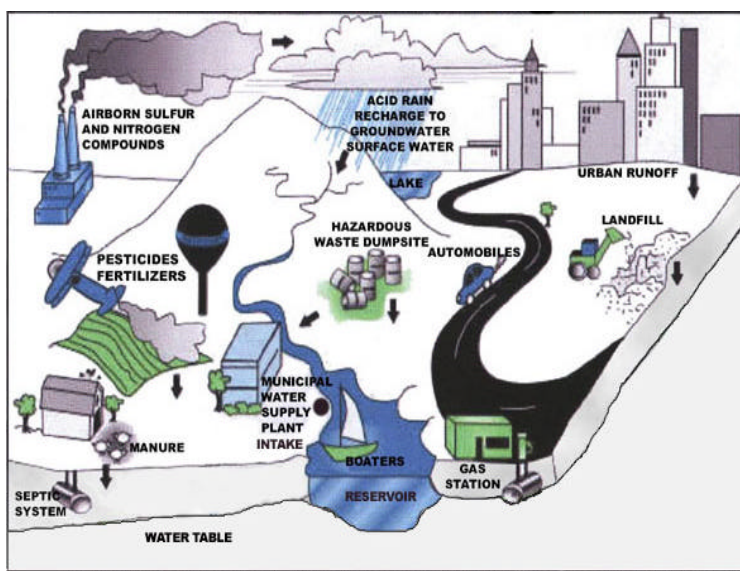


Figure 1: Sample watershed with examples of potential sources of contami-

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Is the Zone A posted with “Public Drinking Water Supply” Signs?	Partial	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	NO	Monitoring non-water supply activities in Zone As. Remove activities where possible
Are Zone A storm drain locations identified?	Partial	Braintree is in the process utilizing GPS to identify locations. Randolph has not started this process. Work with local emergency response teams and businesses on Zone A storm drainage.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Do the watershed communities have Surface Water Protection Controls that meet 310 CMR 22.20C?	NO	Work with neighboring municipalities to include the watershed in their protection controls. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws, health regulations, and current regulations.
Planning		
Does the PWS have a local surface water supply protection plan?	NO	Develop a surface water supply protection plan. Follow “Developing a Local Surface Water Supply Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Supplement plan by developing joint emergency response plans with fire departments, Boards of Health, DPWs, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	NO	Establish a committee with representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Encourage watershed communities to inspect commercial and industrial facilities, especially those that may have floor drains that do not lead to sanitary sewers or tight tanks. For more guidance see “Hazardous Materials Management: A Community’s Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	Some	Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial and municipal uses within the watersheds.

Protection Planning Recommendations:

- ✓ Complete the Tri-Town Board's Surface Water Supply Protection Plan. Refer your protection team to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Surface Water Supply Protection Plan".
- ✓ Encourage watershed towns to adopt controls that meet 310 CMR 22.20 (b) and (c). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Continue to work with municipal boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the municipalities, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the protection areas that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

As with many water supply protection areas, the system watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Develop and implement a Surface Water Supply Protection Plan.
- ✓ Work cooperatively with Boards of Health to develop an inventory of septic systems.
- ✓ Work with businesses and others who have landscaped areas in the watersheds to encourage BMPs for the use of fertilizer and pesticide.
- ✓ Continue to partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure cooperation on responding to spills or accidents.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Continue to inspect the Zone A areas regularly, and when feasible, remove prohibited non-water supply activities.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above, and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watersheds. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN TRI TOWN WATER BOARD WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
230030	ABLESTAR CORPORATION	33 WALES AVE	AVON	TURRPT	BELOW TOXICS USE REDUCTION REG LEVELS
270884	EDART TRUCK RENTAL CORP OF MA	140 WALES AVE	AVON	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
226503	TETRA LAVAL FOOD	91 WALES AVE	AVON	PLANT	AIR QUALITY PERMIT
130194	TL EDWARDS INC	100 WALES AVE REAR	AVON	PLANT	RES APPLICATION APPROVED
319625	ABBOTT DAVID R INC	48 BROOKS DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
292318	ACCESSORY STOP	105 ROCSAM PARK RD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
130337	AINSLIE CORPORATION	531 POND STREET	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
308849	ANACOMP INC - FARM RIVER	39 BROOKS DRIVE	BRAINTREE	HANDLR	LARGE QUANTITY GENERATOR
266381	BLUE HILL CEMETARY	700 WEST ST	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
331468	BOSTON CARS INC	66 ROC SAM PARK ROAD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
331468	BOSTON CARS INC	66 ROC SAM PARK ROAD	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
6088	BRAINTREE WATER DEPARTMENT	KING HILL RD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
216341	CHRISTY FOOD PRODUCTS INC	10 CHARLAM DR	BRAINTREE	DISCH	MWRA SEWER CONNECTION
133490	COCA COLA BOTTLING CO OF NEW ENG	825 GRANITE ST	BRAINTREE	HANDLR	Very Small Quantity Generator
133490	COCA COLA BOTTLING CO OF NEW ENG - Farm River	825 GRANITE ST	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
270912	CON-WAY TRANSPORTATION SERVICES - FARM RIVER	145 LUNDQUIST DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
270912	CON-WAY TRANSPORTATION SERVICES	145 LUNDQUIST DR	BRAINTREE	HANDLR	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
216344	CYTOSOL LABORATORIES	55 MESSINA DR	BRAINTREE	DISCH	MWRA SEWER CONNECTION
319625	DAVID R ABBOTT INC	48 BROOKS DR	BRAINTREE	DISCH	MWRA SEWER CONNECTION
133509	DICKINSON ADVERTISING	120 CAMPANELLI DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
292320	ENTERTAINMENT TOURS	105 ROCSAM PARK DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
292320	ENTERTAINMENT TOURS	105 ROCSAM PARK DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
34972	FAREAST AUTOMOTIVE SERVICE INC	555 POND ST	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
294197	FORMAL WEAR MANAGEMENT INC	141 CAMPANELLI DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
294197	FORMAL WEAR MANAGEMENT INC	141 CAMPANELLI DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
242864	FORMALWEAR MANAGEMENT INC	141 CAMPANELLI DR	BRAINTREE	TURRPT	LARGE QUANTITY TOXIC USER
332165	FX MESSINA ENTERPRISES	100 MESSINA DRIVE	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
215602	GEORGE H DEAN COMPANY	140 CAMPANELLI DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
215602	GEORGE H DEAN COMPANY	140 CAMPANELLI DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
29938	HAEMONETICS CORP	400 WOOD RD	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
29938	HAEMONETICS CORP	400 WOOD RD	BRAINTREE	HANDLR	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
29938	HAEMONETICS CORPORATION	400 WOOD RD	BRAINTREE	TURRPT	LARGE QUANTITY TOXIC USER
317791	HALL TRASK EQUIPMENT COMPANY	105 ROC SAM PARK RD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
34105	HAMILTON SPECIALTIES INC	55 MESSINA DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
31104	HAZELTINE CORP	115 BAY STATE DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
31104	HAZELTINE CORP	115 BAY STATE DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
34437	INTERSTATE BRANDS	60 POND ST	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
292316	JAMES AUTO BODY AND REPAIR	105 ROCSAM PARK RD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
242856	MACDONALD & EVANS PRINTERS INC	1 REX DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
337851	MARCONI AEROSPACE SYSTEMS INC	115 BAY STATE DRIVE	BRAINTREE	DISCH	MWRA SEWER CONNECTION
216371	MILLARD METAL SERVICE	116 LUNDQUIST SR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
282104	N CIBOTTI - FARM RIVER	79 ROC SAM PARK RD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
37838	NORTHEAST APPAREL INC	1 NORTHEAST WAY CAMPANELLI IND	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
281361	NORTHEAST TRUCK AND AUTO INC	77 ROC SAM PARK RD	BRAINTREE	HANDLR	NON-NOTIFIER HW FAC THAT IS SUBJ TO REGS BUT NOT PERMITTED
205774	OUTPUT TECHNOLOGIES INC	70 CAMPANELLI DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR
205774	OUTPUT TECHNOLOGIES INC	70 CAMPANELLI DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
365388	PENSKE TRUCK LEASING CO LP	140 MESSINA DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
365388	PENSKE TRUCK LEASING CO LP	140 MESSINA DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
133502	RIVERSIDE AUTO BODY	549 POND ST	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
317319	RS ROWE & COMPANY INC	100 MESSINA DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
279968	RUAN LEASING CO	15 CHARLAM DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
279968	RUAN LEASING CO	15 CHARLAM DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
282109	STOP & SHOP CO	90 CAMPANELLI DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
131790	SYMMONS IND INC	31 BROOKS DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
133500	TRUCK CENTER OF BRAINTREE	141 MESSINA DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
133500	TRUCK CENTER OF BRAINTREE	141 MESSINA DR	BRAINTREE	HANDLR	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
11614	VERIZON NEW ENGLAND INC	125 LINQUIST DR	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
36092	WEYMOUTH CONCRETE INC	35 ROC SAM PARK RD	BRAINTREE	HANDLR	VERY SMALL QUANTITY GENERATOR
136151	CUMBERLAND FARMS 2192	2640 WASHINGTON ST	CANTON	FULDSP	FUEL DISPENSER
367522	EXXONMOBIL OIL CORP	2776 WASHINGTON ST	CANTON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
126606	SUNOCO SERVICE STATION	2782 WASHINGTON ST	CANTON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
126606	SUNOCO SERVICE STATION	2782 WASHINGTON ST	CANTON		
320072	TEXACO SERVICE STATION	2760 WASHINGTON ST	CANTON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
320072	TEXACO SERVICE STATION	2760 WASHINGTON ST	CANTON		

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
288088	MDC BLUE HILLS LABOR YARD - FR	681 HILLSIDE ST	MILTON	FULDSP	FUEL DISPENSER
2824	ARES ADVANCED TECHNOLOGY	280 POND ST	RANDOPH	DISCH	MWRA SEWER CONNECTION
134262	AUTO CRAFT INC	685 NORTH ST	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
126854	BEST PETROLEUM CO INC	870 NORTH MAIN ST	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR WASTE OIL/PCBS
342756	BISCO ENVIRONMENTAL	91 PACELLA PARK DRIVE	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
183273	BOSTON CHEMICAL INDUSTRIES INC	92 YORK AVE	RANDOLPH	TURRPT	LARGE QUANTITY TOXIC USER
116121	BOSTON CHEMICAL INDUSTRIES INC	92YORKAVE	RANDOLPH	TURRPT	BELOW TUR REGULATED THRESHOLDS
314651	BOSTON HIGASHI SCHOOL FOR AUTISM	800 NORTH MAIN ST	RANDOLPH	PLANT	NON-NOTIFIER AQ FAC THAT IS SUBJ TO REGS BUT NOT PERMITTED
132174	CPC INC	1 CIRCUIT DR	RANDOLPH	TURRPT	LARGE QUANTITY TOXIC USER
132174	CPC INC	1 CIRCUIT DR	RANDOLPH	DISCH	MWRA SEWER CONNECTION
132174	CPC INC	1 CIRCUIT DR	RANDOLPH	HANDLR	LARGE QUANTITY GENERATOR RCRA HAZARDOUS WASTE
132174	CPC INCORPORATED	1 CIRCUIT DR	RANDOLPH	PLANT	AQ NATURAL MINOR W/ PTE < OR = 25% OF MAJ
131624	DAMICO J INC	10 YORK AVE	RANDOLPH	HANDLR	EPA TRANSPORTER (NO COMPLIANCE FEE)

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
131624	DAMICO J INC	10 YORK AVE	RANDOLPH	HANDLR	TRANSPORTER
136534	ELIAS & TONY AUTO REPAIR INC	1150 N MAIN ST	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
306291	EMERSON & CUMING MICROWAVE PRODUCTS	28 YORK AVE	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
306291	EMERSON & CUMING MICROWAVE PRODUCTS	28 YORK AVE	RANDOLPH	PLANT	BELOW AQ REGULATED THRESHOLDS
51843	FLEXCON INDUSTRIES	300 POND ST	RANDOLPH	PLANT	AQ NATURAL MINOR W/ PTE<MAJ & >50% OF MAJ
51843	FLEXCON INDUSTRIES	300 POND ST	RANDOLPH	DISCH	MWRA SEWER CONNECTION
51843	FLEXCON INDUSTRIES	300 POND ST	RANDOLPH	HANDLR	LARGE QUANTITY GENERATOR WASTE OIL/PCBS
51843	FLEXCON INDUSTRIES	300 POND ST	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
319692	HEALTHSTAR INC	1 RANDOLPH RD	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
319692	HEALTHSTAR INC	1 RANDOLPH RD	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR WASTE OIL/PCBS
184464	HOLIDAY INN	1374 NORTH MAIN STREET	RANDOLPH	DISCH	MWRA SEWER CONNECTION
283603	MD STETSON	92 YORK AVE	RANDOLPH	DISCH	MWRA SEWER CONNECTION
367343	MOBIL 12331	93 MAZZEO DR	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
177982	MOBIL OIL CORP SS N3W	93 MAZZEO DR	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
177982	MOBIL OIL CORP SS N3W	93 MAZZEO DR	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR WASTE OIL/PCBS
136522	RANDOLPH AUTOMOTIVE SERVICE CENTER INC	1245 NORTH MAIN STREET	RANDOLPH	HANDLR	LARGE QUANTITY GENERATOR WASTE OIL/PCBS
136522	RANDOLPH AUTOMOTIVE SERVICE CENTER INC	1245 NORTH MAIN ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
282125	RANDOLPH ENGINEERING	26 THOMAS PATTEN DR	RANDOLPH	DISCH	MWRA SEWER CONNECTION
282125	RANDOLPH ENGINEERING	26 THOMAS PATTON DR	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR WASTE OIL/PCBS
368668	SEARS ROEBUCK & CO 9276	21 PACELLA PARK DR	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
285322	SERONO LABORATORIES INC	27 PACELLA PARK DR	RANDOLPH	DISCH	MWRA SEWER CONNECTION
285322	SERONO REPRODUCTIVE BIOLOGY INSTITUTE	27 PACELLA PARK DRIVE	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
325693	SHELL	86 MAZZEO DR	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
209990	SPEEDY LUBE INC	633 NORTH MAIN ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
136537	SUNOCO	422 NORTH ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
330253	SUNOCO	870 NORTH MAIN ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
136537	SUNOCO SERVICE STATION	422 NORTH ST	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
136535	SUPERSHINE CAR WASH CITGO	1201 NORTH MAIN ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
373842	TEK	208 HIGH ST	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
373842	TEK	208 HIGH ST	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR WASTE OIL/PCBS
319983	TEXACO	1370 NORTH MAIN ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
319983	TEXACO SERVICE STATION	1370 NORTH MAIN ST&SCANLON	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
136534	TNT AUTOMOTIVE INC	1150 NORTH MAIN ST	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
22849	TRUCKLEASE CORP	55 YORK AVENUE	RANDOLPH	HANDLR	SMALL QUANTITY GENERATOR WASTE OIL/PCBS
22849	TRUCKLEASE CORP	55 YORK AVENUE	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR RCRA HAZARDOUS WASTE
127222	US POSTAL SERVICE	16 THOMAS PATTEN DR	RANDOLPH	FULDSP	FUEL DISPENSER STAGEII
53143	WILLIAM I HORLICK COMPANY INC	91 PACELLA PARK DR		PLANT	BELOW AQ REGULATED THRESHOLDS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
265359	BJS WHOLESALE CLUB 34	901 TECHNOLOGY CENTER DR	STOUGHTON	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
208726	GLOBAL RECYCLING TECHNOLOGIES INC	387 PAGE ST UNIT 789	STOUGHTON	DISCH	BELOW INDUSTRIAL WASTE WATER REG LEVELS
2878	HONORCRAFT INC	292 A PAGE ST	STOUGHTON	DISCH	MWRA SEWER CONNECTION
315011	IMAGEMAX INC	80 HAWES WAY	STOUGHTON	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
54167	KOCHMAN REIDT & HAIGH	471 PAGE ST	STOUGHTON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
308583	LESCO INC	387 PAGE ST	STOUGHTON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
283875	NATIONAL GRAPHICS INC	471 PAGE ST	STOUGHTON	DISCH	MWRA SEWER CONNECTION
280159	SIGN SYSTEMS INC	421 PAGE ST	STOUGHTON	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE

UNDERGROUND STORAGE TANKS WITHIN TRI TOWN WATER BOARD WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
EDART TRUCK RENTAL	100 WALES AVE FRONT	AVON	TRUCK/TRANSPORT	10000	DIESEL
T L EDWARDS INC	100 REAR WALES AVE	AVON	TRUCK/TRANSPORT	20000	DIESEL
T L EDWARDS INC	100 REAR WALES AVE	AVON	TRUCK/TRANSPORT	5000	GASOLINE
AMI TRUCKLEASE	55 YORK AVE	RANDOLPH	TRUCK/TRANSPORT	10000	DIESEL
MOBIL - #12331	93 MAZZEO DR	RANDOLPH	GAS STATION	10000	GASOLINE
MOBIL - #12331	93 MAZZEO DR	RANDOLPH	GAS STATION	10000	GASOLINE
MOBIL - #12331	93 MAZZEO DR	RANDOLPH	GAS STATION	10000	GASOLINE
MOBIL - #12331	93 MAZZEO DR	RANDOLPH	GAS STATION	10000	GASOLINE
MOBIL - #12331	93 MAZZEO DR	RANDOLPH	GAS STATION	1000	WASTE OIL
MUTUAL	1150 N MAIN ST	RANDOLPH	GAS STATION	6000	GASOLINE
MUTUAL	1150 N MAIN ST	RANDOLPH	GAS STATION	6000	GASOLINE
MUTUAL	1150 N MAIN ST	RANDOLPH	GAS STATION	8000	GASOLINE
NORTH RANDOLPH SERVICE	1201 W MAIN ST	RANDOLPH	GAS STATION	4000	GASOLINE

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
NORTH RANDOLPH SERVICE	1201 W MAIN ST	RANDOLPH	GAS STATION	4000	GASOLINE
NORTH RANDOLPH SERVICE	1201 W MAIN ST	RANDOLPH	GAS STATION	4000	GASOLINE
NORTH RANDOLPH SERVICE	1201 W MAIN ST	RANDOLPH	GAS STATION	4000	GASOLINE
NORTH RANDOLPH SERVICE	1201 W MAIN ST	RANDOLPH	GAS STATION	4000	GASOLINE
RANDOLPH AUTOMOTIVE SERVICENTER	1245 N MAIN ST	RANDOLPH	GAS STATION	6000	GASOLINE
RANDOLPH AUTOMOTIVE SERVICENTER	1245 N MAIN ST	RANDOLPH	GAS STATION	8000	GASOLINE
RANDOLPH AUTOMOTIVE SERVICENTER	1245 N MAIN ST	RANDOLPH	GAS STATION	8000	GASOLINE
RANDOLPH AUTOMOTIVE SERVICENTER	1245 N MAIN ST	RANDOLPH	GAS STATION	2500	DIESEL
RANDOLPH AUTOMOTIVE SERVICENTER	1245 N MAIN ST	RANDOLPH	GAS STATION	500	WASTE OIL
RYDER STUDENT TRANS	15 YORK AVE	RANDOLPH	TRUCK/TRANSPORT	3000	DIESEL
SHELL SERVICE STATION 22063580306	MAZZEO DR	RANDOLPH	GAS STATION	10000	GASOLINE
SHELL SERVICE STATION 22063580306	MAZZEO DR	RANDOLPH	GAS STATION	8000	GASOLINE
SHELL SERVICE STATION 22063580306	MAZZEO DR	RANDOLPH	GAS STATION	6000	GASOLINE

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
SPEEDY LUBE AND AUTO CARE	633 N MAIN ST	RANDOLPH	GAS STATION	12000	GASOLINE/D
SUNOCO # 0437-6349	870 N MAIN ST	RANDOLPH	GAS STATION	8000	GASOLINE
SUNOCO # 0437-6349	870 N MAIN ST	RANDOLPH	GAS STATION	8000	GASOLINE
SUNOCO # 0437-6349	870 N MAIN ST	RANDOLPH	GAS STATION	5000	GASOLINE
SUNOCO # 0437-6349	870 N MAIN ST	RANDOLPH	GAS STATION	5000	GASOLINE
US GAS	954 N MAIN ST	RANDOLPH	GAS STATION	8000	GASOLINE
US GAS	954 N MAIN ST	RANDOLPH	GAS STATION	3000	GASOLINE
US GAS	954 N MAIN ST	RANDOLPH	GAS STATION	6000	GASOLINE
US GAS	954 N MAIN ST	RANDOLPH	GAS STATION	3000	GASOLINE
GAGRLER REALTY	KAY WAY & RT 139	STOUGHTON			

FOR MORE INFORMATION ON UNDERGROUND STORAGE TANKS, VISIT THE MASSACHUSETTS DEPARTMENT OF FIRE SERVICES WEB SITE:
[HTTP://WWW.STATE.MA.US/DFS/UST/USTHOME.HTM](http://www.state.ma.us/dfs/ust/usthome.htm)

NOTE: THIS APPENDIX INCLUDES ONLY THOSE FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA(S) THAT MEET STATE REPORTING REQUIREMENTS AND REPORT TO THE APPROPRIATE AGENCIES. ADDITIONAL FACILITIES LOCATED WITHIN THE WATER SUPPLY PROTECTION AREA(S) SHOULD BE CONSIDERED IN LOCAL DRINKING WATER SOURCE PROTECTION PLANNING.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Tri Town Board Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN).

RTN	Release Site Address	Town	Contaminant Type
3-0003431	77 Roc Sam Park Rd	Braintree	Oil
3-0004029	825 Granite St	Braintree	--
3-0016811	681 Hillside St	Milton	Oil
3-0001524	954 North Main St	Randolph	--
3-0019730	105 Mazzeo Dr	Randolph	Oil And Hazardous Material
3-0021031	105 Mazzeo Dr	Randolph	Hazardous Material
4-0010012	1589 Turnpike St	Stoughton	Oil

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Brewster Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Brewster Water Department
<i>PWS Address</i>	1671 Main Street
<i>City/Town</i>	Brewster, Massachusetts
<i>PWS ID Number</i>	4041000
<i>Local Contact</i>	Paul V. Hicks
<i>Phone Number</i>	(508) 896-5454

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 96

Susceptibility: High

Well Names	Source IDs
Freeman's Way GP Well #1	4041000-01G
Freeman's Way GP Well #2	4041000-02G

Zone II #: 95

Susceptibility: High

Well Names	Source IDs
Freeman's Way GP Well #s	4041000-03G

Zone II #: 45

Susceptibility: Moderate

Well Names	Source IDs
GP Well #4	4041000-04G

Brewster has four groundwater wells pumping water from the Monomoy Lens. The Monomoy Lens is one of the six groundwater lenses that make up the Cape Cod Sole Source Aquifer. Each of the wells has large tracts of undeveloped land surrounding them for water quality protection. The two original wells, #'s 1 & 2, south of Freeman's Way and near Route 6 were constructed in 1971 and are approximately 76 feet deep. Well #3, built in 1986, is north of Freeman's Way near Route 6, is 90 feet deep. Well #4, built in 1991, is at the north edge of the Punkhorn Parklands, near Run Hill Road, is 101 feet deep. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

A 'Greensand' filtration treatment facility has been constructed to remove iron and manganese from Well #4. Treatment includes potassium hydroxide for pH adjustment and corrosion control, potassium permanganate used for oxidation of minerals. Sodium hypochlorite, a liquid chlorine solution, is used for oxidation of minerals and for final disinfection required for water filtration processes, at a concentration of 0.2 to 0.4 ppm free chlorine. Other water treatment used in Brewster includes: Hydrated Lime, used for pH adjustment and corrosion control. The lime is added to the water at treatment facilities at Wells 1 & 2, and Well 3. Sodium hypochlorite, is also added at all wells as a preventative disinfectant during system flushing. This chemical is added at a concentration of approximately 0.6 ppm free chlorine for approximately 6 weeks each spring and fall. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Brewster are dominated by forest with smaller areas of residential use and a very small percentage of the Zone IIs contains commercial and industrial land use (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with

further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Use s and Protection Issues include:

1. Zone I protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. The four Zone Is for Brewster's wells are owned or controlled by the public water system.

Zone I Recommendations:

- ✓ Continue to keep all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Never use or store pesticides, fertilizers or road salt within the Zone Is.

2. Residential Land Uses – Approximately 7% of the Zone IIs consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to

the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

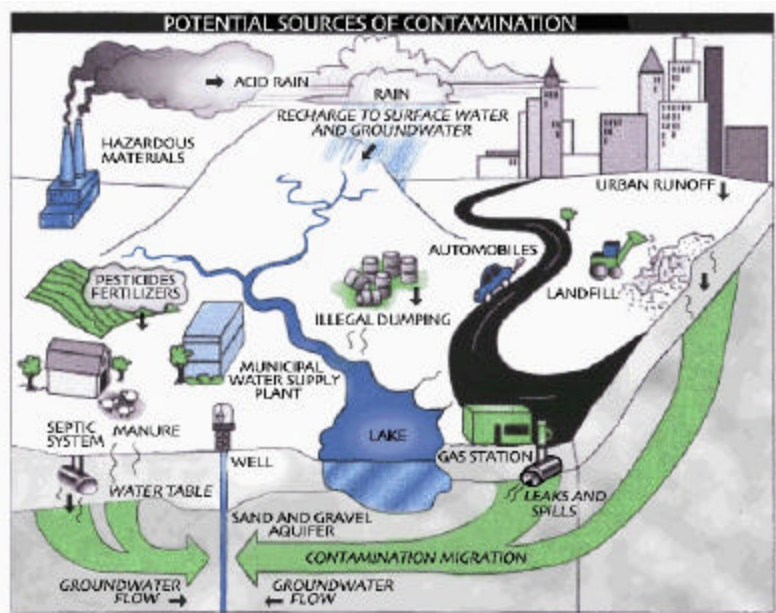
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 6 runs through the Zone IIs for wells #1, #2 and #3. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone Is.
- ✓ Work with the Town and State to have catch basins inspected, maintained,

and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Small areas within the Zone IIs for Wells #1, #2

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

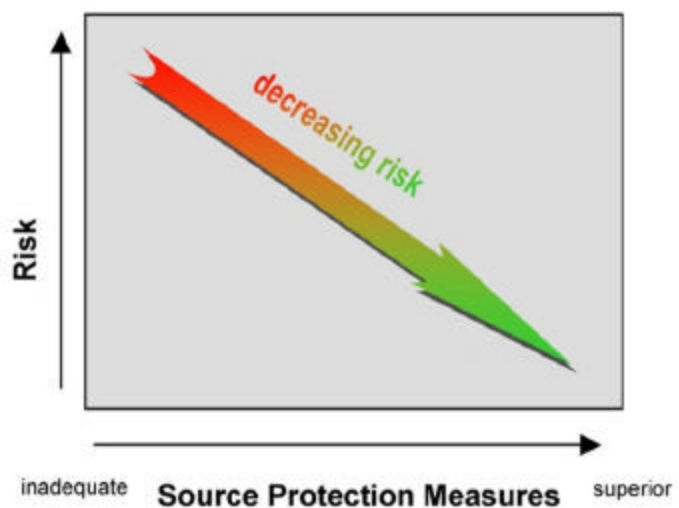


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	#96	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	#95 and #96	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Boat Yards/Builders	1	H	#95	Fuels, paints, and solvents: spills, leaks, or improper handling
Golf Courses	1	M	#95 and #96	Fertilizers or pesticides: over-application or improper handling
Sand And Gravel Mining/Washing	1	M	#95	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Industry/Industrial Parks	1	H	#95	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	numerous	M	#45, #95 and #96	Fuel oil: spills, leaks, or improper handling

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Residential				
Lawn Care / Gardening	numerous	M	#45, #95 and #96	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	#45, #95 and #96	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	several	M	#45, #95 and #96	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	several	L	#45, #95 and #96	Microbial contaminants
Clandestine Dumping	1	M	96	Debris containing hazardous materials or wastes (Road closed to prevent future problems)
Fishing/Boating	several	L	#45, #95 and #96	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	95	Seepage of leachate
Stormwater Drains/ Retention Basins	numerous	L	#45, #95 and #96	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	numerous	M	#45, #95 and #96	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

and #3 is for commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Protection Planning – Currently, Brewster has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Continue to implement Brewster’s Wellhead Protection Plan. Use your Wellhead Protection Committee to coordinate protection efforts with all stake holders within Brewster and surrounding area.
- ✓ Ensure local wellhead protection controls are current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include boat yards/builders, a golf course, sand and gravel mining and a stump dump. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring municipalities to protect current and future sources of water.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update wellhead protection plan as needed. Visit: www.state.ma.us/dep/brp/dws/ for DEP guidance documents.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Use committee to implement Wellhead protection plan.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Enacting local controls that meet DEP's protection regulations 310 CMR 22.21(2).
- Actively purchasing land for wellhead protection.
- Restricting vehicle access to wells by closing road.
- Promoting the adoption of a turf management plan that includes nitrate reduction and water testing at Brewster's ballfields and the golf course.
- Well house fencing.
- Supporting household hazardous waste collection days and providing source protection educational materials to the public.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor operations and actions at stump dump and sand and gravel operation.
- ✓ Continue to implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
None Identified						

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Stephen French Youth Forestry Camp	456 Flax Pond Road	Brewster	Removed	----	---	---	---

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Bridgewater Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Bridgewater Water Department
<i>PWS Address</i>	Academy Building, Central Square
<i>City/Town</i>	Bridgewater
<i>PWS ID Number</i>	4042000
<i>Local Contact</i>	Joseph Silva
<i>Phone Number</i>	(508) 697-0910

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

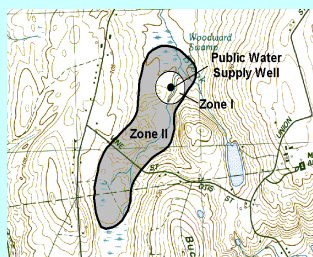
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II # 245

Susceptibility: High

Well Names	Source IDs
Gravel Packed Well No. 1	4042000-03G
Gravel Packed Well No. 2	4042000-04G
Gravel Packed Well No. 4	4042000-06G
Gravel Packed Well No. 5	4042000-07G
Gravel Packed Well No. 7	4042000-08G

Zone II # 135

Susceptibility: High

Well Names	Source IDs
Gravel Packed Well No. 3	4042000-02G
Gravel Packed Well No. 6	4042000-05G
Gravel Packed Well No. 8	4042000-09G
Gravel Packed Well No. 9	4042000-10G

The wells for Bridgewater Water Department are located on the south and west sides of Carver Pond and east of the Matfield River and south of High Street. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Bridgewater Water Department also purchases some of its water from the purchased source listed in the table above. Please see the appendices for copies of the SWAP reports for each of these purchased source providers.

All active wells have potassium hydroxide added for corrosion control. Sodium hypochlorite is added as a disinfectant to all active wells. Gravel Packed Wells No. 1, 2, 4, and 5 are treated by greensand filtration for the removal of iron. Blended phosphates are added to Gravel Packed Wells No. 3, 6, 8, and 9 for sequestering iron. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Bridgewater Water Department are a mixture of residential, commercial, agricultural and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are

listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Body shops, service stations, and auto repair shops
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Junk yards and salvage yards
7. Railroad tracks
8. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Some of the Zone I areas are not owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Gravel Packed Well No. 3, 6, and 8 (4042000-02G, -05G, and -09G) – The Zone Is for these sources contain a section of High Street and several Town owned buildings.

Zone I: Gravel Packed Well No. 5 (4042000-07G) – The Zone I for Gravel Packed Well No. 5 contains a section of Conant Street and private residences.

Zone I Recommendations:

- ✓ If it's not feasible to purchase privately owned land within the Zone Is at

this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

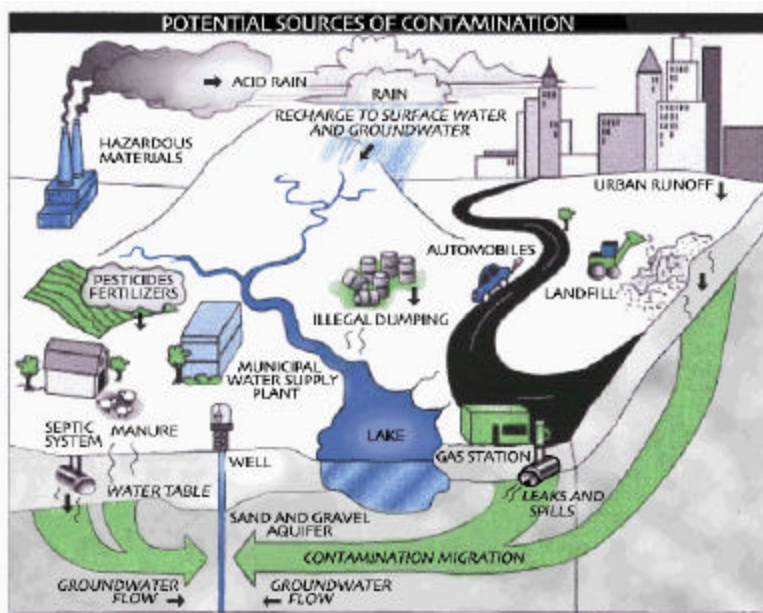
2. Residential Land Uses – Approximately 30% to 40% of the Zone II consists of

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

residential land use. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

3. Body Shops, Service Stations, and Auto Repair Shops – Body shops store and use paints and solvents. Service stations and auto repair shops store and handle automotive fluids and they collect waste automotive fluids. Releases to the groundwater can occur if these materials are not handled or contained properly.

Body Shops, Service Stations, and Auto Repair Shops Recommendation:

- ✓ Encourage these businesses to use BMP’s for the storage, handling, and disposal of all hazardous chemicals, paints, oils and waste oils.
- ✓ If any of these facilities have floor drains, ensure that the floor drains lead to a tight tank or municipal sewer as required by the plumbing code and Underground Injection Control Regulations, 310 CMR 27.00.

4. Hazardous Materials Storage and Use – Small areas of the Zone IIs are used for

(Continued on page 7)

Source Protection Decreases Risk

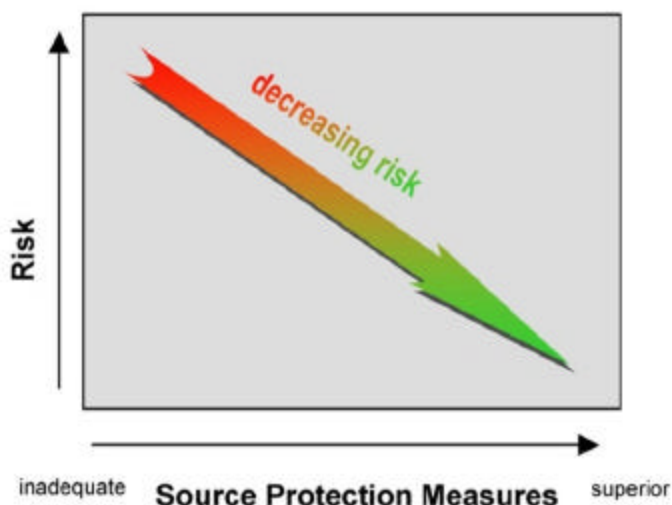


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	numerous	Moderate	245 & 260	Fertilizers: leaks, spills, improper handling, or over-application
Commercial				
Body Shops	2	High	245	Vehicle paints, solvents, and primer products: improper management
Service Stations/ Auto Repair Shops	2	High	245	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	1	Moderate	260	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Junk Yards and Salvage Yards	2	High	260	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Medical Facility	1	Moderate	245	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Railroad Tracks And Yards	1	High	245	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Sand And Gravel Mining/Washing	1	Moderate	260	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	Moderate	260	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	numerous	Moderate	245 & 260	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	245 & 260	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	245 & 260	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	numerous	Low	245 & 260	Microbial contaminants
Fishing/Boating	yes	Low	245 & 260	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste Generators	1	High	245	Hazardous materials and waste: spills, leaks, or improper handling or storage
Road And Maintenance Depots	1	Moderate	260	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Tire Dumps	1	Moderate	260	Tires: improper handling or management
Transmission Line Rights-of-Way (electrical)	1	Low	260	Corridor maintenance pesticides: over-application or improper handling; releases from ruptured oil lines
Transportation Corridors	1	Moderate	245	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Very Small Quantity Hazardous Waste Generator	2	Low	245	Hazardous materials and waste: spills, leaks, or improper handling or storage

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Oil or Hazardous Material Contamination Sites – Zone II No. 245 contains DEP Tier Classified Hazardous Material Release Site indicated on the map as Release Tracking Number 4-0012347. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Junk Yards and Salvage Yards – Spills, leaks, or improper handling of automotive chemicals, wastes, and batteries can potentially contaminate the water supply.

Junk Yards and Salvage Yards Recommendations:

- ✓ Notify the junkyards/salvage yards that their facilities are located in a public water supply protection area.
- ✓ Work with owners to be sure that best management practices are used for

proper handling of materials and in containing spills and leaks.



7. Railroad Tracks – Railroad tracks are located in Zone II #245. Over-application or improper handling of herbicides on railroad right-of-ways are potential sources of contamination. Leaks or spills of transported chemicals or train maintenance chemicals are also potential sources of contamination to the water supply.

Recommendations:

- ✓ Work with local officials during their review of the railroad right-of-way Yearly Operating Plans to ensure that the portion of right-of-way within the Zone II is not sprayed with herbicides.
- ✓ Work with your local fire department to ensure that the Zone II is included in Emergency Response Planning.

8. Protection Planning – Currently, the Town has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Attempt to purchase or control all Zone I area. Work toward the removal of non-water supply related activities from within the Zone I.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I areas?	YES	Prevent future non-water supply activities from occurring in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town “Aquifer Protection District” bylaw meets DEP’s requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see “Hazardous Materials Management: A Community’s Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

water supply wells.

Protection Planning Recommendations:

- ✓ Coordinate efforts with local officials to periodically compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If the controls do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone IIs include agricultural, cemetery, medical facility, sand and gravel mining/washing operations, asphalt or concrete plant, road and maintenance depot, tire dump, electrical transmission line, and transportation corridor. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The Town's adoption of Aquifer Protection Bylaws and floor drain controls.
- Obtaining a Wellhead Protection Grant for fencing in all well houses and placing security grates on the windows, and for the development of GIS data layers that, among other uses, will be used for wellhead protection measures.
- Obtaining a Wellhead Protection Grant for providing water supply protection outreach and education to elementary school students and to businesses and residents located within the Town's Aquifer Protection District for Wells No. 1, 2, 4, and 5.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for known oil or hazardous waste contamination sites.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone IIs. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection
- D. SWAP Report for East Bridgewater Water Department

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 1

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
28792	Bridgewater Auto Body	456 Bedford St	Bridgewater	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
316310	Walter Earl Chevrolet	300 Bedford St	Bridgewater	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
377253	Endontic Health	481 Bedford St	Bridgewater	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0012347	552 Bedford Street	Bridgewater	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Stiles and Hart Brick Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Stiles and Hart Brick Company
PWS Address	127 Cook Street
City/Town	Bridgewater, MA 02324
PWS ID Number	4042003
Local Contact	Lincoln Andrews
Phone Number	508-697-6928

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well # 1	01G	100	415	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

The well provides drinking water to the Stiles and Hart Brick Company. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 415 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

The well serving the facility has no treatment at this time. DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (maintenance building, parking lot, road)
2. Manufacturing Facility; DEP Tier Classified Oil or Hazardous Material Release Sites; Very Small Quantity Generator of Waste Oil or PCBs; Very Small Quantity Generator of Hazardous Waste
3. Septic System
4. Above Ground Diesel Fuel Storage Tank
5. Transportation Corridor
6. Aquatic Wildlife

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Manufacturing Facility (DEP Tier Classified Oil or Hazardous Material Release Sites; Very Small Quantity Generator of Waste Oil or PCBs and Hazardous Waste)	Yes	Yes	H	leaks or spills of chemicals, wastes and other materials
Septic System	No	Yes	M	hazardous chemicals; microbial contaminants; improper disposal
Above Ground Diesel Fuel Storage Tank	No	Yes	M	leaks or spills of fuels
Parking Lot; Roadway	Yes	Yes	M	storm runoff containing contaminants; leaks or spills from vehicles; vehicular accidents
Aquatic Wildlife	Yes	Yes	L	microbial contaminants

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the well is HIGH based on the presence of at least one HIGH threat within the Zone I and IWPA.

1. **Zone I**– The public water system owns or controls the Zone I, posts water supply awareness signs and conducts inspections. A maintenance building, parking lot and road are located within the Zone I. The public water system does not meet DEP's Zone I requirements because of these non-water supply activities within the Zone I.

Recommendations

- ✓ As much as possible, keep non-water supply activities out of the Zone I.
- ✓ Continue to conduct regular inspections of the Zone I.
- ✓ Do not use pesticide, fertilizers or de-icing materials within the Zone I.

2. **Office Building and Brick Manufacturing Plant** are located within the IWPA. The facility is also the site of DEP Tier Classified Oil or Hazardous Material Releases. It is also a Very Small Quantity Generator of Waste Oil or PCBs and a Very Small Quantity Generator of Hazardous Waste.

Recommendations

- ✓ Use BMPs for handling, storing, using and disposing of chemicals and wastes.
- ✓ Reduce the use of chemicals if possible.
- ✓ Train employees in spill prevention and other water supply protection measures.

3. **Septic System**– The septic system for the facility is located within the IWPA.

Recommendation

- ✓ Inspect and maintain the septic system regularly.

4. **Above Ground Diesel Fuel Storage Tank** – There is a diesel fuel tank within the IWPA.

Recommendation

- ✓ Inspect and maintain any containment structures.

5. **Parking Lot and Roadway** – A road runs through the Zone I and the IWPA. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing. Spills from vehicular accidents can also contaminate public drinking water sources.

Recommendation

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.

6. **Aquatic Wildlife** – There is an open water body within, and several nearby, the IWPA. Aquatic birds frequent the Zone I and IWPA.

Recommendation

- ✓ Discourage birds from loafing in the Zone I.

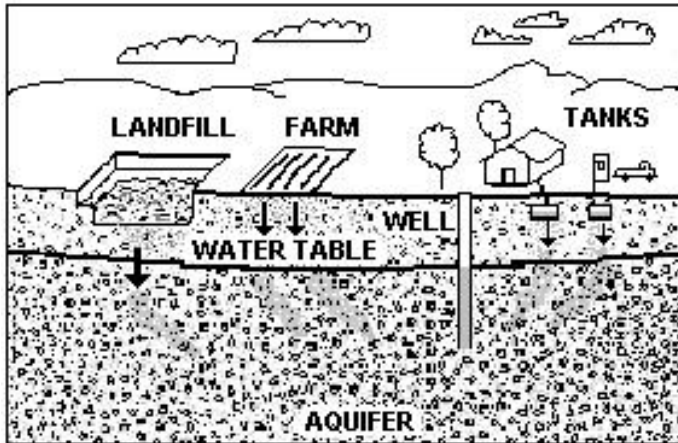


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. Facility operators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Inspect the Zone I.

Training and Education

- ✓ Train employees on the proper use, handling, storage and disposal of chemicals and wastes.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Inspect and maintain the septic system in the IWPA.
- ✓ Inspect and maintain spill containment structures.

Planning

- ✓ Update the emergency response plan at least annually.

Funding

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures fact sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Brockton Water System

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Brockton Water System
<i>PWS Address</i>	39 Montauk Road
<i>City/Town</i>	Brockton, MA 02301
<i>PWS ID Number</i>	4044000
<i>Local Contact</i>	Brian M. Creedon, Manager
<i>Phone Number</i>	508-580-7825

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells and reservoirs may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

This report includes the following sections:

1. Description of the Water System;
2. Land Uses in the Protection Areas;
3. Source Water Protection;
4. Source Water Protection Recommendations;
5. Additional Resources Available for Source Water Protection; and
6. Appendices.

What is a Protection Area?

Reservoirs

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Wells

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA) as shown on the attached map.

Zone I: is the area that should be owned or controlled by the water supplier and limited to water supply activities.

IWPA: is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Section 1: Description of the Water System

<i>Ground Water Sources</i>		<i>Susceptibility: High</i>
<i>Source Name</i>	<i>Source ID #</i>	
Hubbard Street well (inactive)	4044000-01G	
<i>Surface Water Sources</i>		<i>Susceptibility: High</i>
<i>Source Name</i>	<i>Source ID #</i>	
Silver Lake	4044000-01S	
Brockton Reservoir	4044000-02S	

Brockton has two active drinking water reservoirs and one inactive drinking water well.

Silver Lake is located in Pembroke, Hympton and Kingston. Its watershed is located in those communities and in Halifax. Brockton Reservoir is located in Avon. The watershed extends into Brockton, Avon and Stoughton. Monponsett Pond and Furnace Pond are considered tributaries to Silver Lake. The inactive well and its Interim Wellhead Protection Area (IWPA) is located in Brockton.

It is a challenge to protect sources that are located in communities other than the community being served. The Brockton Water System is commended for taking an active role in implementing source protection measures.

For current information on monitoring results and treatment or for a copy of the most recent Consumer Confidence Report, please contact the public water system contact person listed above in Table 1. Drinking water monitoring data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The watersheds for the Brockton Water System are primarily a mix of undeveloped forest (42% for Silver Lake, 38% for Brockton Reservoir), residential development (23% and 14%), agriculture, industry (18% for Brockton Reservoir), commercial uses and protected open space. The IWPA contains predominantly residential (35%), commercial (21%) and industrial (8%) uses, with some forest.

A Geographic Information Systems (GIS) map showing the watershed boundaries, Zone I, IWPA, and the percentages of land uses in the protection areas is provided as part of this report. Section 3 discusses protection measures implemented by the Brockton Water System. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities in Appendix B.

Key Land Uses and Protection Issues Include:

1. Residential Land Uses
2. Transportation Corridors
3. Transmission Lines
4. Chemical Storage
5. Industrial Facilities (including a Large Quantity Toxic User & Large Quantity Hazardous Waste Generators)
6. Oil or Hazardous Material Release Sites
7. Wastewater Treatment Plant with NPDES Major Discharges
8. Hazardous Waste Treatment, Storage and/or Disposal Facility
9. Active Aboveground and Underground Storage Tanks
10. Agriculture
11. Aquatic Wildlife
12. Department of Public Works Facility
13. Golf Course

1. Residential Land Uses – About 23% of the watershed for Silver Lake and 14% of the watershed for Brockton Reservoir consist of residential development. Both watersheds have large amounts of undeveloped forest with the potential for more residential development. The Massachusetts Executive Office of Environmental Affairs (EOEA)'s web site, www.state.ma.us/envir/, provides detailed information and maps about the build-out of developable land in communities in Massachusetts.

If managed improperly, household hazardous waste, septic systems, lawn care and pet waste can all contribute to ground and surface water contamination. Household hazardous wastes include automotive wastes, paints, solvents and other substances that should be disposed of properly at a municipal collection site. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Many septic systems are located around Monponsett Pond. Improperly applied fertilizers and pesticides can wash off lawns and into surface waters. Pet waste may contain bacteria, parasites or viruses that are health risks.

Residential Land Use Recommendations:

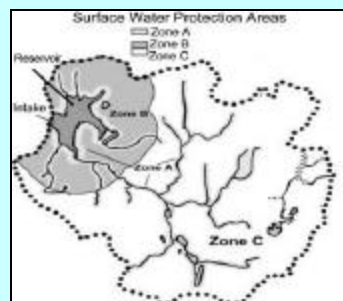
- ✓ Work with town officials to control residential growth on undeveloped land.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the protection areas extend.
- ✓ Educate residents on how to protect water supplies. Distribute the fact sheet *Residents Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Post water supply awareness signs on streets throughout the watersheds.
- ✓ Work with town boards to review and provide recommendations on proposed watershed development.
- ✓ Install a sewer collection system around Monponsett Pond.

2. Transportation Corridors (paved and unpaved local roads & highways) are located near the reservoirs, throughout the watersheds, and within the IWPA. A major highway interchange of Route 24 is located directly upstream of Brockton Reservoir and crosses over a tributary to the reservoir. Spills from vehicular accidents are a major concern. In addition, road salt, construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. The Water System Manager intends to pursue low salt use on Route 24.

Stormwater can transport contaminants into ground and surface waters, including wetlands. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Potential contaminants may come from automotive leaks, maintenance, washing, or accidents.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Transportation Corridor Recommendations:

- ✓ Establish vegetated buffers along roads and parking areas to provide some filtration of contaminants.
- ✓ Schedule regular street sweeping. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.
- ✓ Post water supply awareness signs on streets throughout the watersheds.
- ✓ Conduct an emergency drill to be ready for spills.
- ✓ Regularly inspect the watershed and IWPA for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps are not available yet, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Continue with plan to pursue low salt use on Route 24.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Transmission (Utility) Lines (herbicide application) - Transmission lines run through the watersheds. These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

Transmission (Utility) Lines Recommendation:

- ✓ Monitor the YOP for pesticide applications.

4. Chemical Storage - Chemicals are stored at commercial and industrial facilities within the watershed of Brockton Reservoir and within the IWPA.

Chemical Storage Recommendation:

- ✓ Encourage facility owners/operators to provide sufficient secondary containment to control spills.

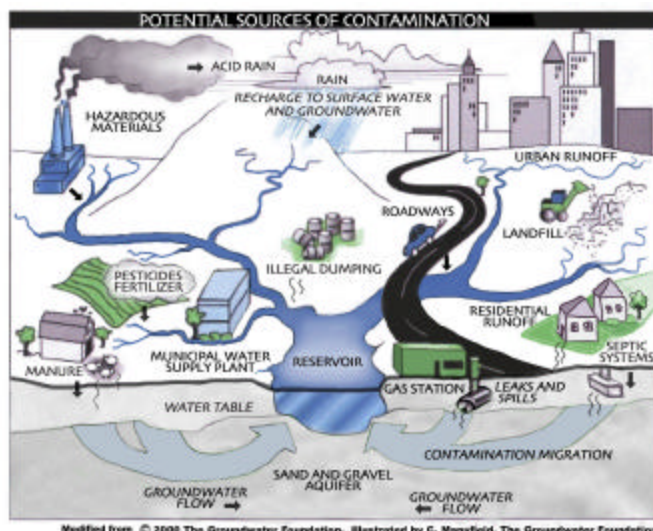


Figure 1: Sample watershed with examples of potential sources of contamination

5. Industrial Facilities - including a Large Quantity Toxic User (LQTU) and Large Quantity Generators of Hazardous Waste (LQG)

- There are industrial facilities within the watershed of Brockton Reservoir and within the IWPA. There is an LQTU and LQGs within the watershed of Brockton Reservoir and an LQG within the IWPA. Chemical use, handling and storage is a concern, as well as the handling, storage and disposal of hazardous waste.

Industrial Park Recommendations:

- ✓ Request that businesses contact you in the case of spills or releases.
- ✓ Encourage BMPs for handling, storing and disposing of chemicals and hazardous waste.

6. Oil or Hazardous Material Release Sites

- There are nine DEP Tier Classified Oil or Hazardous Material Release Sites located within the watersheds and the IWPA. Refer to the attached

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

Refer to Appendix B for more information on regulated facilities.

Land Uses	Quantity	Threat	Source		Potential Sources of Contamination*
Agricultural					
Fertilizer Storage or Use	Few	M	-	02S	leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H	-	02S	leaks, spills, improper handling, or over-application of pesticides
Residential					
Fuel Oil Storage (at residences)	Numerous	M/M	01G	01S	spills, leaks, or improper handling of fuel oil
Lawn Care / Gardening	Numerous	M/M	01G	01S	over-application or improper storage and disposal of pesticides
Septic Systems / Cess-pools	Numerous	M/M	01G	01S	microbial contaminants, improper disposal of hazardous chemicals
Commercial					
Golf Course	1	M	01G	-	improper handling or over-application of fertilizers or pesticides
Industrial					
Industrial Facilities, including a Large Quantity Toxic User & Large Quantity Generators of Hazardous Waste	numerous industries, 1 LQ TU (02S), 4 LQGs (1-01G; 3-02S)	H/H	01G	02S	spills, leaks or other releases of chemicals or metals; improper storage or handling
Wastewater Treatment Plant with Major NPDES Discharges	1 plant; 2 discharges	M	01G	-	spills or leaks from improper handling, storage or disposal of wastewater and treatment chemicals

Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
 - For more information on regulated facilities, refer to Appendix B.
 - For information about Oil or Hazardous Materials Sites, refer to Appendix C.
- * **THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Miscellaneous					
Aquatic Wildlife	Seasonal	H	-	01-02S	microbial contaminants
Transportation Corridors	Numerous	M/H	01G	01-02S	leaks or spills of fuels and other hazardous materials; salt; over-application or improper handling of pesticides; erosion from construction
Transmission Lines	1	H	-	01-02S	spills from over-application or improper handling of pesticides; erosion from construction
Chemical Storage at Commercial Facilities	Few	H/H	01G	02S	spills, leaks, or improper handling or storage of chemicals
DEP Tier Classified Oil or Hazardous Materials Release Sites	5/1/3	not ranked	01G	01-02S	see Appendix C for more information
Hazardous Waste Treatment, Storage and/or Disposal Facility (TSDF)	1	H	-	02S	spills, leaks of hazardous wastes
Active Above & Underground Storage Tanks	3/5	M/M; H/M	01G	02S	spills, leaks of stored materials
Road & Maintenance Depot	1	M	-	02S	spills and leaks from the use and storage of sand, salt, gasoline and chemicals

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
 2. For more information on regulated facilities, refer to Appendix B.
 3. For information about Oil or Hazardous Materials Sites, refer to Appendix C.
- * **THREAT RANKING** - Where there are two rankings, the first is for ground water, the second for surface water. The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

GIS map and Appendix C for more information.

Oil/Hazardous Waste Recommendation:

- ✓ Educate businesses on best management practices for protecting water supplies. Distribute the fact sheet *Businesses Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.

7. **Wastewater Treatment Plant with NPDES Major Discharges** - There is a wastewater treatment plant within the IWPA. There are two NPDES discharges associated with this facility.

Treatment Plant/NPDES Recommendation:

- ✓ Ask to be contacted by the facility operator in the case of spills or unexpected releases of wastewater or chemicals.

8. **Hazardous Waste Treatment, Storage and/or Disposal Facility (TSDF)** - There is a TSDF within the watershed of Brockton Reservoir.

TSDF Recommendation:

- ✓ Ask to be contacted by the facility operator in the case of spills or unexpected releases of hazardous wastes or chemicals.

9. **Active Above and Underground Storage Tanks** - There are above and underground storage tanks located within the watershed of Brockton Reservoir and within the IWPA.

UST Recommendation:

- ✓ Encourage the owners of the tanks to install secondary containment to control spills.

10. **Agriculture** – Cranberry bogs are located within the watershed of Silver Lake. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or

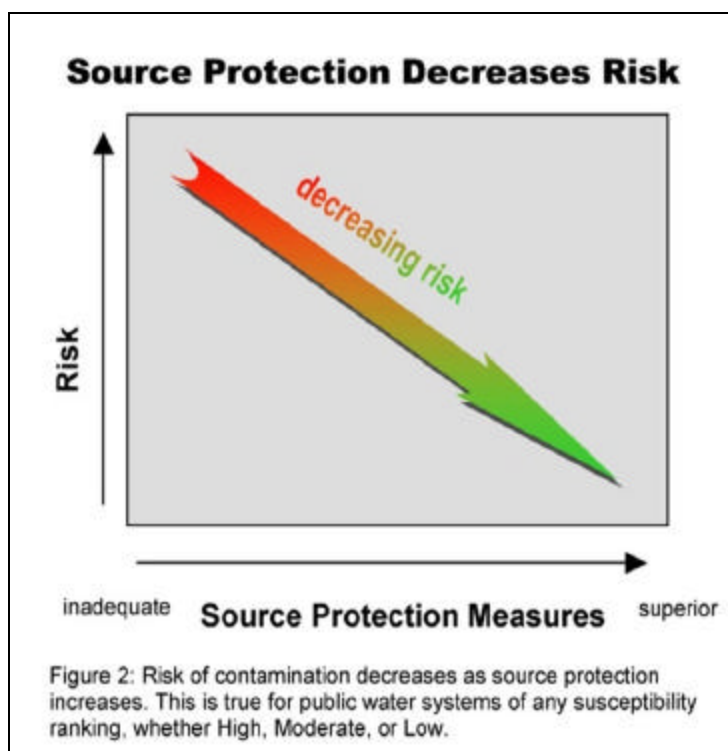
disposed. Agricultural activities can also be a potential source of microbial contamination. The Massachusetts Drinking Water Regulations, 310 CMR 22.00, prohibit animals within 100 ft. of drinking water reservoirs and their tributaries.

Agricultural Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a U.S. Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.
- ✓ The Massachusetts Department of Food & Agriculture's booklet titled "On-Farm Strategies to Protect Water Quality—An Assessment & Planning Tool for Best Management Practices" (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.
- ✓ Work with farmers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.

Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



11. Aquatic Wildlife - Geese are seasonally present on, or adjacent to, the reservoir. Waterfowl may increase coliform levels through the release of fecal matter into the water and may also carry other bacteria and viruses. Waterfowl management techniques may include noise and visual harassment, habitat modification and control of food sources. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

Aquatic Wildlife Recommendation:

- ✓ Monitor wildlife populations, including beaver, in and around the reservoirs. Discourage feeding of geese and other waterfowl.

12. Department of Public Works (DPW) Facility - Pembroke's (DPW) yard is located within the watershed of Brockton Reservoir. Salt, sand and gasoline can be used or stored at these facilities.

DPW Recommendations:

- ✓ See Appendix A for *DPWs Protect Drinking Water*.
- ✓ Maintain contact with Pembroke's DPW about protection measures and emergency response.

13. Golf Course - There is a golf course located partially within the IWPA. Pesticide and fertilizer spills or over-applications and chemical spills are a concern.

Golf Course Recommendation:

- ✓ Work with the owner/operator of the golf course to encourage the implementation of source protection measures, such as: establishing vegetated buffers to control runoff; minimizing pesticide and fertilizer use; adhering to DEP policy on vehicle washing; and properly storing chemicals.

Section 3: Source Water Protection

As with many water supply protection areas, this system's watersheds and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

The Brockton Water System is commended for taking an active role in implementing source protection measures. Examples of their good work include the following.

Watershed Control

The City owns or controls a significant amount of the watershed lands. The Water Systems Manager has a good knowledge of, and stays aware of, conditions within the IWPA and the watersheds. In December 2001, the Water Systems Manager sent local officials in the watershed communities letters requesting to be notified about proposals for new and expanding development.

Water Supply Education

The Water Systems Manager conducts educational programs and works with community groups to promote water supply protection and water conservation.

SECTION 4: SOURCE WATER PROTECTION RECOMMENDATIONS

DEP recommends that the Brockton Water System implement the following source protection measures.

- ✓ Work with local officials to control residential growth on undeveloped land.
- ✓ Continue to educate residents about their role in drinking water protection.
- ✓ Post water supply awareness signs along roads in the watersheds.
- ✓ Discourage birds from lingering at Silver Lake and Brockton Reservoir and look for the presence of beaver.
- ✓ Continue to communicate with watershed communities about protection measures and emergency response.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watersheds.
- ✓ Encourage regular street sweeping in the watershed communities.
- ✓ Conduct regular inspections of watershed areas.
- ✓ Continue with plan to pursue low salt use on Route 24.
- ✓ Install a sewer collection system around Monponsett Pond.

Section 5: Additional Resources Available for Source Water Protection

DEP staff, informational documents and resources are available to help build on this SWAP report and to help improve drinking water protection.

Information about DEP Tier Classified Oil or Hazardous Material Release Sites can be obtained at DEP's Bureau of Waste Site Cleanup's web site, www.state.ma.us/dep/bwsc. Sites are identified on the attached GIS map and site specific information is available in Appendix C.

Section 6: Appendices

- A. Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Businesses Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
- B. List of Regulated Facilities.
- C. Table of Tier Classified Oil and/or Hazardous Material Sites.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

- 1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- 2. MA DEP SWAP Strategy
- 3. Land Use Pollution Potential Matrix
- 4. Draft Land/Associated Contaminants Matrix

For More Information

www.state.ma.us/dep

The following DEP staff can be contacted for more information and assistance on improving watershed protection.

Mike Quink, 508-946-2766, DEP's Southeast Regional office
Kathy Romero, 617-292-5727, DEP's Boston office

For More Information

Contact Mike Quink in DEP's Lakeville office at (508) 946-2766 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Comments/Recommendations
Zone I and Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	NO Zone I	Monitor activities within the Zone I.
	NO Zone A	Monitor Zone A activities. See 310 CMR 22.20B for Zone A restrictions.
Are the watersheds posted with Public Drinking Water Supply signs?	YES	Economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Monitor activities within the Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C(2) and Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	NO	Refer to 310 CMR 22.21(2), 310 CMR 22.20C(2), and mass.gov/dep/brp/dws/ for model bylaws, health regulations, and current state regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	NO	Stay aware of proposed development in the watersheds and provide recommendations on protection measures to town boards.
Planning		
Does the PWS have a local surface water protection plan?	A surface water plan for Monponsett Pond is under development.	Develop a plan for Silver Lake.
Does the PWS have a formal Emergency Response Plan to deal with spills or other emergencies?	A plan is under development.	Brockton has a hazardous materials crew that also serves surrounding communities.
Does the municipality have a water supply protection committee?	NO	The Water System Manager works with community groups to promote water supply awareness and protection.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	For more guidance see <i>Hazardous Materials Management: A Community's Guide</i> at www.state.ma.us/dep/brp/dws/files/hazmat.doc .
Does the PWS provide water supply protection education?	YES	Continue to educate residents and businesses about their role in drinking water protection. Appendix A contains the fact sheets <i>Residents Protect Drinking Water</i> and <i>Businesses Protect Drinking Water</i> .

Transient Non-Community **Source Water Assessment and Protection (SWAP) Report** **for** **ROCKY MOUNTAIN SPRING WATER (SOURCE)**



Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource
Protection, Drinking Water
Program

Date Prepared:
January 21, 2004

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

The Massachusetts Department of Environmental Protection (DEP) Drinking Water Program is undertaking this task. The rankings of susceptibility of your well(s) to potential contamination are listed in Table 1.

Table 1: Public Water Supply Information

<i>PWS Name</i>	Rocky Mountain Spring Water
<i>PWS Address</i>	Arthur Street
<i>City/Town</i>	Brockton, Massachusetts
<i>PWS ID Number</i>	4044005

Table 2: Source Information

<i>Well Name</i>	<i>Well (Source) ID#</i>	<i>Zone I Radius (feet)</i>	<i>IWPA Radius (feet)</i>	<i>Microbial Susceptibility*</i>	<i>Non-Microbial Susceptibility**</i>
Rocky Mt. Spring Water	4044005-01G	100	500	High	Moderate

Table 3: Vending Information

<i>PWS Name</i>	<i>Source ID</i>
Rocky Mt. Spring Water (Attleboro)	4016002-01P
Rocky Mt. Spring Water (Attleboro)	4016003-01P
Rocky Mt. Spring Water @ Tede	
Rocky Mt. Spring Water (Roslindale)	
Rocky Mt. Spring Water (Everett)	
Kappy's Liquor	
Rocky Mt. Spring Water (Randolph)	
Rocky Mt. Spring Water (Revere)	
Curtis Liquor	

* Common sources of microbial contamination include septic systems, wildlife and livestock operations. These types of activities in the source protection area increase your well's Microbial Susceptibility.

** Sources of non-microbial contamination include inorganic and organic chemicals. Inorganic contaminants include metals and naturally occurring minerals. Organic contaminants include fuels, degreasing solvents, herbicides and pesticides.

What is the Purpose of This Report?

This report identifies the most significant *potential contaminant sources* that could threaten your well's water quality. Your susceptibility ranking does not imply poor water quality. Actual water quality is best reflected by the results of your regular water tests.

What is Susceptibility?

Susceptibility is a measure of your well's potential to become contaminated by land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA). Please see the enclosed map for your well's Zone I and IWPA areas.

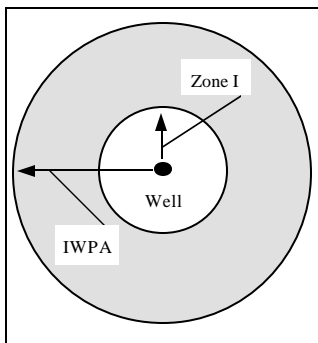
The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMPs) are used. The susceptibility determination for your well did not take into account whether BMPs are being used.

Susceptibility of a drinking water well does *not* mean a customer will drink contaminated water. Water suppliers protect drinking water by monitoring water quality, treating water supplies, and using BMPs and source protection measures to ensure that safe water is delivered to the tap.

Figure 1: ZONE I/ IWPA EXAMPLE

Source Protection Area for ROCK SPRING WATER (4044005-01G)

Zone I = 100 ft.
IWPA = 500 ft.



What is my Well's Source Protection Area?

A well's source protection area is the land around your well where protection activities should be focused. Your public drinking water supply well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA). The Zone I is the area that should be owned or controlled by the water supplier and limited to water supply activities. The IWPA is the larger area that is likely to contribute water to the well. Refer to **Figure 1** on page 2 for an example of a Zone I and IWPA.

An IWPA is the land located within a fixed radius of the well. The IWPA radius is based upon the average pumping rate of the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

How Was my Well's Susceptibility Determined?

Your well's **high** susceptibility to potential microbial threats is based on the presence of septic system components within the Zone I and/or IWPA. The **moderate** susceptibility to potential non-microbial threats is based on the presence of local roads and vehicle parking within the Zone I and/or the IWPA.

This source water assessment report is based on information provided by you on your 2002 Public Water Supply Annual Statistical Report, water quality data and/or from other sources of information. DEP has not verified the accuracy of the information submitted with the report.

Recommendations for your Well

All public water systems with groundwater sources should ensure that only activities necessary for the operation and maintenance of the drinking water system occur within the well's Zone I.

Specific Recommendations:

- v inspect the Zone I and IWPA regularly;
- v work with the Board of Health and other local officials to make sure your well(s) are included in local regulations and inspection efforts;
- v restrict access to the well and post the area with *Drinking Water Protection Area* signs;
- v make certain that a proper sanitary seal is in place for the well (grouted casing and concrete pad);
- v remove oil/hazardous materials storage tanks, and hazardous materials use or storage from the Zone I;
- v do not use pesticides, fertilizers or road salt within the Zone I;
- v address septic system issues in Zone I; remove septic system, relocate well or pursue upgrading options;
- v water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.

Need More Information?

Additional information or sources of information can be obtained by calling Isabel Collins at (508) 946-2726 or visiting DEP's Drinking Water Web site at <http://www.state.ma.us/dep/brp/dws>.

Glossary

- Best Management Practices (BMPs) are operational procedures used to prevent or reduce pollution.
- Public Water System is a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days of the year.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Canton Water and Sewer Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved

Table 1: Public Water System Information

<i>PWS Name</i>	Canton Water and Sewer Division
<i>PWS Address</i>	801 Washington Street
<i>City/Town</i>	Canton, Massachusetts
<i>PWS ID Number</i>	3050000
<i>Local Contact</i>	Ron Redquest - General Supervisor
<i>Phone Number</i>	(781) 821-5017

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

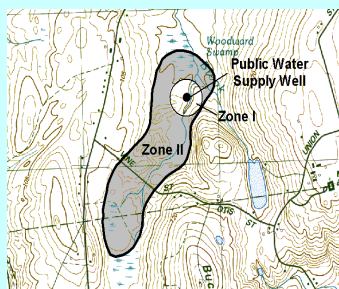
Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

What is a Protection

Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Section 1: Description of the Water System

Zone II #: 223

Susceptibility: High

Well Names	Source IDs
Well #4 (Pecunit Street)	3050000-06G

Zone II #: 224

Susceptibility: High

Well Names	Source IDs
Well #5 (Forest Ave.)	3050000-07G
Well #7 (Neponset Street)	3050000-09G
Well #10 (Forest Ave.)	3050000-10G

IWPA

Susceptibility: High

Well Names	Source IDs
Well #1 (Washington Street)	3050000-01G

The water for the Canton Water and Sewer Division comes from five wells in two Zone IIs and an IWPA. Water is also purchased from the Massachusetts Water Resources Authority (MWRA); a copy of the SWAP report for the MWRA is attached. Each well has a Zone I of 400 feet. Wells #1 and #7 are inactive, but are included in this report. The Zone II #224 for Wells #5, #7, and #10 extends in to the towns of Norwood and Sharon. The IWPA for Well #1 extends from Stoughton into Canton. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

The three active wells are treated for corrosion control and fluoridated for dental health. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs and IWPA for Canton are a mixture of residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Residential Land Uses
3. Transportation Corridors
4. Hazardous Materials Storage and Use
5. Oil or Hazardous Material Contamination Sites
6. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone Is for Well #1, #5, and #10 are owned or controlled by the public water system, but the Zone Is for Well #4 and Well #7 are not. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The Zone I for Well #4 includes a fairway for a golf course which works with the water supplier to use BMPs to protect the source. The Zone I for Well #7 contains a small corner of an industrial building that is connected to municipal sewer on the edge of the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Much of the Zone IIs and IWPA consists of residential areas. Most of the areas have public sewers, but some areas still use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** – Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances.

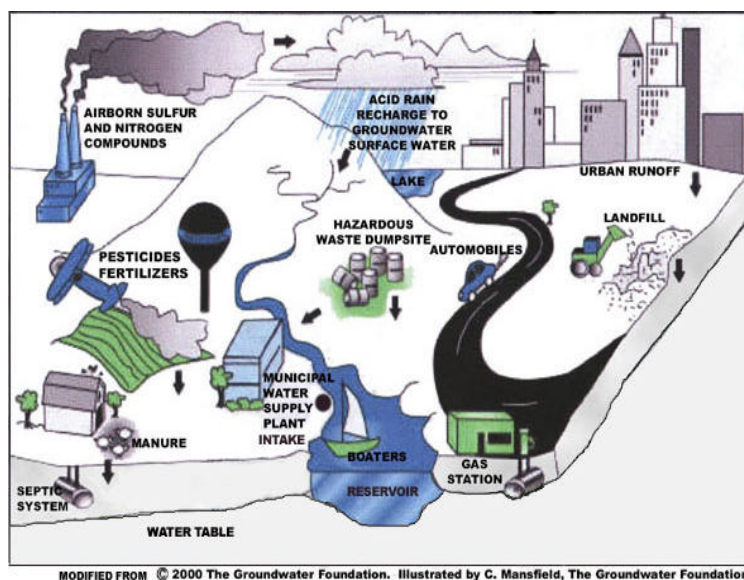


Figure 1: Sample watershed with examples of potential sources of contamination

Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 95 runs through the Zone II for Wells #5, 7 and 10. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

Railroad tracks run through the Zone II for Wells #5, 7, and 10. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – A small percent of the land area within the Zone IIs and IWPA is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

(Continued on page 6)

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Location	Potential Source of Contamination
Commercial				
Gas Stations	2	H	Zone II #224	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	1	H	Zone II #224	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	2	M	Both Zone IIs	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	2	M	Both Zone IIs	Fertilizers or pesticides: over-application or improper handling
Junk Yards and Salvage Yards	1	H	IWPA	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Medical Facilities	1	M	Zone II #223	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Photo Processors	1	H	Zone II #224	Photographic chemicals: spills, leaks, or improper handling or storage
Railroad Tracks and Yards	1	H	Zone II #224	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Industrial				
Industry/ Industrial Parks	1	H	Zone II #224	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Paper Manufacturers	1	H	Zone II #223	Bleaches, dyes, waste products, and other chemicals: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care/Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Zone II #224	Hazardous chemicals: microbial contaminants, and improper disposal

Activities	Quantity	Threat*	Location	Potential Source of Contamination
Miscellaneous				
Aboveground Storage Tanks	4	M	Zone II #223	Materials stored in tanks: spills, leaks, or improper handling
Schools, Colleges, and Universities	3	M	Zone II #223	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Numerous	L	Both Zone IIs	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way: Gas	1	L	Zone II #223	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	1	M	Zone II #224	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Wastewater Treatment Plant/Collection Facility/Lagoon	1	M	Zone II #224	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management
Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

(Continued from page 4)

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure "Industrial Floor Drains" for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 3-0012555, 3-0000941, 3-0020140, 3-0003928, 3-0003538, 3-0000635. Refer to the attached map and Appendix C for more information.

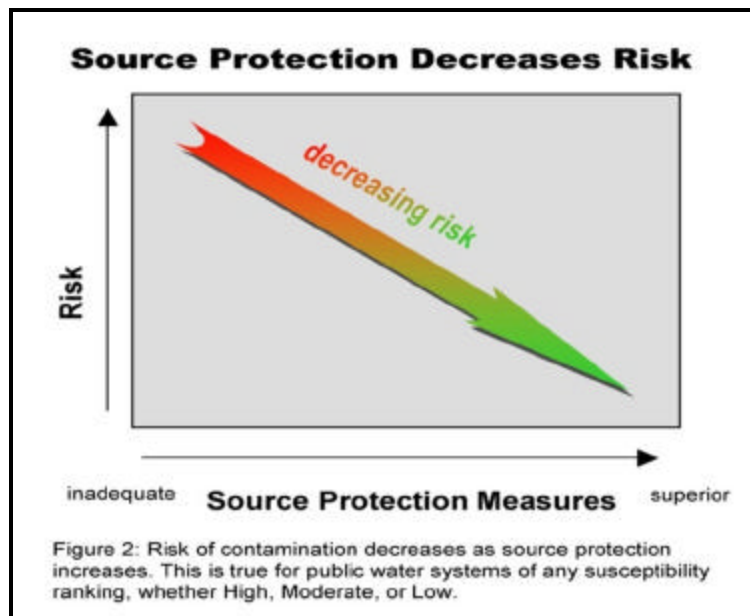
What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, the Town has water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.



Protection Planning Recommendations:

- ✓ Develop a comprehensive Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

Other land uses and activities within the Zone IIs and IWPA are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES - Well #1, #5, #10 NO - Well #4, #7	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES - Well #1, #5, #10 NO - Well #4, #7	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town “Aquifer Protection District” bylaw currently meets DEP’s requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Continue to work with Sharon and Stoughton to include your water supply protection areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Develop a comprehensive wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	Local fire department conducts a hazardous materials inspection program. For more guidance see “Hazardous Materials Management: A Community’s Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone IIs and IWPA.

- Working with Zone I land uses such as the golf course to implement BMPs for groundwater protection.
- Working with the fire department on emergency response for the I95 corridor.
- Proactively pursuing and receiving funding through the DEP Wellhead Protection Grant Program to conduct hazardous materials inspections.
- Purchasing land near a new well for protection purposes.
- Adoption of Consolidated Drainage Bylaw that meets Phase II stormwater requirements.
- Annual Household Hazardous Waste Collection Day.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone Is regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Continue to work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone IIs and IWPA and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a comprehensive Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above, and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN CANTON'S WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
137370	Advanced Alternative, Inc.	647 Chapman Street	Canton	Fuel Dispenser	Fuel Dispenser Stage II
35375	Bills Auto Repair	599 Neponset Street	Canton	Handler	Very Small Quantity Generator
35375	Bills Auto Repair	599 Neponset Street	Canton	Fuel Dispenser	Fuel Dispenser Stage II
324891	Blue Hill Press	480 Neponset Street	Canton	Handler	Very Small Quantity Generator
324891	Blue Hill Press	480 Neponset Street	Canton	Handler	Very Small Quantity Generator - Waste Oil/Pcbs Only
36897	Canton Auto Clinic	1047 Turnpike Street	Canton	Handler	Very Small Quantity Generator
26517	Crathco Inc	480 Neponset Street	Canton	Handler	Very Small Quantity Generator
215619	Downey Joe Chevrolet Inc.	1027 Turnpike Street	Canton	Handler	Very Small Quantity Generator
215619	Downey Joe Chevrolet Inc.	1027 Turnpike Street	Canton	Handler	Large Quantity Generator - Waste Oil/Pcbs Only
130458	Draper Properties Inc.	28 Draper Lane	Canton	Plant	AQ Synthetic Minor W/Restr Pte < Or = 25% Of Maj
130458	Draper Properties Inc.	28 Draper Lane	Canton	Discharge	MWRA Sewer Connection
130469	Emerson & Cuming Composites Material Inc.	59 Walpole Street	Canton	TURA Reporter	Large Quantity Toxic User

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
130469	Emerson & Cuming Composites Material Inc.	59 Walpole Street	Canton	Handler	Small Quantity Generator
216787	Grindmaster Corporation	480 Neponset Street	Canton	Discharge	MWRA Sewer Connection
227867	Massachusetts Hospital School	3 Randolph Street	Canton	Plant	AQ Synthetic Minor W/Restr But <Or= 50% Of Maj
227867	Massachusetts Hospital School	3 Randolph Street	Canton	Handler	Very Small Quantity Generator
284322	Otis Clapp And Sons Inc.	115 Shawmut Road	Canton	Discharge	MWRA Sewer Connection
258544	Sherman Printing Company Inc.	1020 Turnpike Street	Canton	Handler	Small Quantity Generator
258544	Sherman Printing Company Inc.	1020 Turnpike Street	Canton	Handler	Small Quantity Generator - Waste Oil/Pcbs Only
135687	Sun Company Inc.	702 Neponset Street	Canton	Handler	Very Small Quantity Generator
126606	Sunoco	2782 Washington Street	Canton	Fuel Dispenser	Fuel Dispenser Stage II
216809	Tamfelt Inc.	28 Draper Lane	Canton	Discharge	MWRA Sewer Connection
130470	TDL Incorporated	550 Turnpike Street	Canton	Handler	Very Small Quantity Generator
130470	TDL Incorporated	550 Turnpike Street	Canton	Plant	AQ Natural Minor W/ PTE < Or = 25% Of Maj
53500	Town of Canton	1492 Washington Street	Canton	Discharge	MWRA Sewer Connection

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
131201	New England Sinai Hospital	150 York Street	Stoughton	Handler	Small Quantity Generator
35695	Will CC Materials Corp.	168 Washington Street	Stoughton	Handler	Very Small Quantity Generator

UNDERGROUND STORAGE TANKS WITHIN CANTON'S WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
Bills Auto Repair	599 Neponset Street	Canton	Gas Station	10000	Gasoline
Bills Auto Repair	599 Neponset Street	Canton	Gas Station	8050	Gasoline
Mass Hospital School	3 Randolph Street	Canton	Medical Facility	2500	Gasoline
Sunoco	702 Neponset Street	Canton	Gas Station	15000	Gasoline
Sunoco	702 Neponset Street	Canton	Gas Station	15000	Gasoline
New England Sinai Hospital	150 York Street	Stoughton	Medical Facility	1500	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities located within the water supply protection area(s) should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Canton Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
3-0012555	702 Neponset Street	Canton	Oil
3-0000941	Neponset Street	Canton	--
3-0020140	Neponset Street	Canton	Hazardous Material
3-0003928	854 Neponset Street	Canton	Oil
3-0003538	599 Neponset Street	Canton	Oil
3-0000635	647 Chapman Street	Canton	Oil

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).

Source Water Assessment Program (SWAP) Report

For

Benjamin Ellis Pre-School



Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
March 27, 2001

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Benjamin Ellis Pre-School
<i>PWS Address</i>	247 Tremont Street
<i>City/Town</i>	Carver, MA
<i>PWS ID Number</i>	4052006
<i>Local Contact</i>	Head Custodian/Certified operator/ Richard Brown
<i>Phone Number</i>	(508) 866-6243

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4052006-01G	100	416	High

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. DESCRIPTION OF THE WATER SYSTEM

The Well

The Benjamin Ellis Pre-school is a public water system with a single water supply currently serving a population of 91 people. The well is located in a below ground block pit in the playground area west of the school buildings. Well #1 has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 416 feet. Please refer to the attached map of the Zone I and IWPA. The public water systems emergency power is provided by propane gas fuel generator. The well is located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration.

The Water Quality

The public water system installed a corrosion control treatment system in the year 2000. Groundwater samples collected from the Benjamin Ellis Pre-School well in the

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

late 1980s contained volatile organic compounds (VOCs) from an unconfirmed source. The Benjamin Ellis Pre-School is currently monitoring for VOCs on quarterly basis. Samples collected from the well for the second, third, fourth quarters in 1999 and first, second, third quarters in 2000 indicated no detection of VOCs.

The Benjamin Ellis Pre-School has been placed on increased monitoring frequency for nitrate due to detection of nitrate > 5.0 milligrams per liter. Although the maximum contaminant level (MCL) has not been exceeded 310 CMR 22. 06(7) (c) state's relevant part, that for all public water systems, their repeat monitoring frequency for ground water system shall be quarterly for at least one year following any one sample in which the concentration is > 50 percent of MCL. MCL for nitrate is 10 milligrams per liter. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate activities in Zone I;**
2. **Massachusetts DEP oil and hazardous materials incident report #S92-0961**
3. **Two (2) 275 gallon Aboveground Storage Tank (AST) for heating fuel with a floor drain in IWPA in the school basement**
4. **AST for heating fuel in IWPA behind school garage**
5. **Underground Storage Tank (UST) in IWPA**

The overall ranking of susceptibility to contamination for the well is **High**, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

ZONE I:

1. **Zone I-** The public water supplier does not own and/or control all land encompassed by the Zone I. The well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Benjamin Ellis Pre School Zone I contains, a road (Church Street), parking area, school playground and a residence.

Recommendation:

- ✓ Remove all not water supply activities from Zone I to comply with DEP's Zone I requirements. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Table 2: Table of Activities within the Water Supply Protection Areas

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Gas/service station	Underground Storage Tanks	No	Yes	High	Gasoline, diesel?
School	Floor Drain	No	Yes	High	Heating oil AST is located in the same room as floor Drain
Roads	Catch basin, runoff from road salting & spills	Yes	Yes	Moderate	Church Street in Zone I, Tremont Street in IWPA
School	Parking lot, playgrounds, structures	Yes	Yes	Moderate	playground in Zone I
School	Septic System	No	Yes	Moderate	refer to septic systems brochure in the attachment
School	Fuel Storage Above Ground	No	Yes	Moderate	Two (2) steel tanks in school basement, 1 Steel tank behind school maintenance garage exterior
Residences	Septic system, lawncare, heating fuel storage	No	Yes	Moderate	several residences

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

IWPA:

2. **Massachusetts DEP Oil and Hazardous Materials Incident Report #S92-0961-A** review of Massachusetts DEP oil and hazardous materials incident reports (refer to attachments for copy of incident report) indicates petroleum contaminated soil was encountered during an excavation at the Benjamin Ellis Pre-School on Dec. 30, 1992. Contaminated soil was encountered during a percolation test for a new septic system. An out of service underground storage Tank (UST) was encountered on the site. The DEP files are incomplete as to the actions taken by the Town to address the release. On January 31st, 2001, DEP staff contacted the Town of Carver Fire Department for additional information regarding the release. No additional information was located in the Fire Department records. On Jan. 31, 2001, DEP staff contacted school Department staff in order to obtain additional information. The school staff indicated that the town had hired a contractor to oversee further response actions and those response actions consisted of UST and petroleum contaminated soil removal. The DEP has no documentation in its files regarding response actions conducted by the Town of Carver.

Recommendations :

- 3 Review town records and/or contact your consultant to locate any documentation as to the response actions conducted at the Benjamin Ellis Pre-School. Provide the Department with a copy of any documentation regarding this release. If you have any questions regarding this request contact Mark Dakers at (508) 946-2847.
3. **Aboveground Storage Tank and floor drain in the school basement** – Two (2) 275 gallon AST with heating oil without secondary containment are located in the basement of the school within the IWPA. The basement floor has several areas that do not have an impervious service.

A floor drain was observed within the basement of the school building in the same room as the two (2) AST's. The floor drain in the school building is primarily a concern due to the storage of heating fuel AST.

Recommendations:

- ✓ The Department recommends that you provide 110% secondary containment for the AST located in the school basement. Aboveground storage tanks in your IWPA should be located on an impermeable surface. Comply with all provisions of the regulations regarding AST. Any modifications to the AST must be

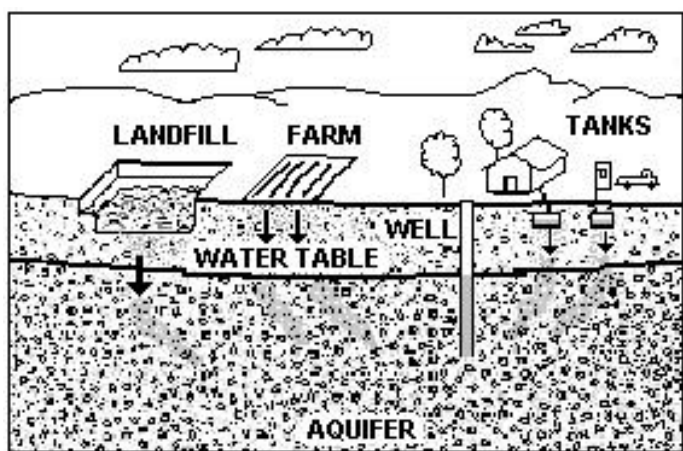


Figure 1: Example of how a well could become contaminated by different land uses and activities.

accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. The Department recommends that you consult with the local fire department for any additional local code requirements regarding AST.

- ✓ Bring the floor drain in the school basement into compliance with DEP's Regulations (refer to attachment "Industrial Floor Drain Brochure"). Floor drains in the Zone I and IWPA should be sealed or connected to a sanitary sewer or tight tank.
 - Contact the UIC coordinator for the Southeast Region Office of the Department for additional technical assistance (Mark Dakers Tele. #508-946-2847).
 - Interim actions: Cease using the floor drain

4. **Aboveground Storage Tank behind Maintenance Garage** - A 275-gallon AST heating oil tank is located behind the garage on the north side of the school. The tank is located outside and does not have secondary

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:
www.state.ma.us/dep/brp/dws.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

containment.

Recommendation:

- ✓ The Department recommends that you provide 110% secondary containment for the AST located behind the maintenance garage. The Department recommends that a roof be placed over the tank to prevent rainwater from collecting within the secondary containment area. Aboveground storage tanks in your IWPA should be located on an impermeable surface must be accomplished in a manner consistent with Massachusetts plumbing, building, and fire code requirements. The Department recommends that you consult with the local fire department for any additional local code requirements regarding AST.

The Benjamin Ellis Pre-School should review and adopt the **key** recommendations above for the potential sources of contamination identified in the Zone I and IWPA.

In addition to the potential sources of contamination identified within the Zone I, there are additional potential sources of contamination in IWPA.

5. **School Septic System**-The school septic system is located approximately 180-ft. south-southeast of the well. The septic system tank and leaching pits are located between the school building and Tremont Street (refer to attachments for more information on septic systems). An application for disposal works construction permit was issued for an individual sewage disposal system at the Benjamin Ellis School on Dec. 15, 1992 (refer to attached) by the Carver Board of Health for a system with a total daily design flow of 1,250 gallons. The Department reviewed septic system plans entitled, "As Built Septic System Plan, the Benjamin Ellis School, Tremont Street, Carver, Massachusetts (Revised 1/7/93)" by Shorey, Nims and Bartlett Inc. Design calculations provided on the plans indicated a total design flow of 672 gallons per day. Additionally, the following note was recorded on the plans; "This is an interim system until such time as the extent of the pollution caused by the ruptured oil tank can be determined and remedial action taken".

A certificate of compliance was issued on Jan. 4, 1993 by the Carver Board of Health (refer to attached) for the interim system with a design flow of 672 gallons per day according to aforementioned plans. There were no other plans or documentation in the Board of Health files, indicating the "interim system" had been replaced with a permanent septic system.

Recommendation:

- ✓ Please provide a certificate of compliance for the sewage disposal system with a total daily flow of 1,250 gallons for the Benjamin Ellis Pre School.
- ✓ Review school/town records and/or contact your consultant to locate any correspondence regarding the replacement of the "interim system". Provide the Department and Carver Board of Health with a copy of any documentation regarding this matter. If you have any questions regarding this request contact Mark Dakers (508) 946-2847.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

6. **Stormwater** - There are several leaching catch basins located along a Tremont Street. Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, Health waste, leakage from dumpsters, improperly dumped household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Catch basins transport storm water from the parking lot, roadway and adjacent properties to the ground. Pollutants are actually not removed from most catch basins until they are cleaned out. Regular maintenance is required to reduce the risk of resuspension of sediments during large storm events. Maintenance is essential for the proper operation of catch basins and oil/water separators.

Recommendations:

- ✓ Work with the community to ensure that storm water runoff instructs away from the well and is treated in accordance with DEP guidance.
- ✓ Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

3. PROTECTION RECOMMENDATIONS

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Benjamin Ellis Pre-school should review and adopt the following **key** recommendations above and the following recommendations.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Pit installations are not allowed by the Department due to safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect the sanitary quality the water being delivered. The Department recommends that the Wellhead be extended to 18 inches above the final grade of the surface.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Continue to not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Work with the Town of Carver to have the catch basins cleaned on a regular schedule. Additionally, an effective nonstructural source control is street and parking lot sweeping.

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information please refer to the attached program fact for 2001 (Please note each program year the Department posts a new Request for Response for the Grant program (RFR)).

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Floor drains in the Zone I and IWPA should be sealed or connected to a sanitary sewer or tight tank.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.

Planning:

- ✓ Work with local officials in Carver to include the Benjamin Ellis Pre-school IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ A gas station, which has USTs containing petroleum hydrocarbons, is located within the IWPA. An UST in IWPA is a concern due to the potential threat posed by the release of its contents if managed improperly.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ✓ These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. ATTACHMENTS

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet

- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- Massachusetts DEP Oil and Hazardous Materials Incident Report #S92-0961
- Application for Disposal Works Construction Permit



Source Water Assessment Program (SWAP) Report For Waterview Associates

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
July 1, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Waterview Associates
PWS Address	27 Jill Marie Drive
City/Town	Carver, Massachusetts
PWS ID Number	4052044
Local Contact	Debra Balboni
Phone Number	508 746-6111

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4052044-01G	210	684	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Waterview Associates is a privately owned retirement housing development serving 64 year-round homes and a clubhouse. The Association is served by Well #1 that is located in a wooded area in the southeast portion of the development. Well #1 is a 4-inch well drilled to a depth of 53 feet below grade. In 1997 the well pit was eliminated and the well casing was extended above grade level. The area around the well was graded as to slope away from the well preventing any standing water to accumulate around the well. The system is equipped with a propane fueled emergency power generator. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. In a Feb. 9, 1987 letter, the Department approved a 72-hour pump test for the well. The average daily withdrawal for the well is limited to 12,800 gallons per day based on the current

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Zone I of 210 feet and Interim Well Protection Area (IWPA) of 684 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA.

Waterview Associates has been placed on increased monitoring frequency for nitrate due to previous detections of nitrate > 5 milligrams per liter. Although the maximum contaminate level (MCL) has not been exceeded 310 CMR 22.06 (7) (c) states in relevant part that for all public water systems, their repeat monitoring frequency for groundwater system shall be quarterly for at least one year following any one sample in which the concentration is > 50 percent of MCL. The MCL for nitrate is 10 milligrams per liter.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

2. Discussion of Land Uses in the Protection Areas

Zone I

The Well meets DEP's restrictions that only allow water supply related activities in Zone I. The public water supplier controls all land encompassed by Zone I.

Recommendations:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **STORM WATER RETENTION PONDS,**
2. **LAWN CARE AND LANDSCAPING,**
3. **SEPTIC SYSTEMS,**
4. **AGRICULTURAL.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Agriculture	No	Well #1	High	Pesticide use and fertilizer use
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Well #1	Moderate	Lawn care, gardening, septic systems, household hazardous waste
Septic System	No	Well #1	Moderate	Refer to septic system brochure in the attachments
Storm Water Drains/Retention Basins	No	Well #1	Low	Two (2) retention basins
Structures	No	Well #1	-	Non-water supply structures in IWPA

* -For more information on Contaminants of Concern associated with individual facility types and land uses please refer to the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Storm Water**—There are two (2) storm water retention areas. A retention pond is located approximately 225 feet north of the well (north pond) and a dry retention basin (west basin) is located approximately 300 feet west of the well. The north pond receives storm water from a series of catch basins interconnected via a drain line under Jill Maria Drive, Douglas Drive and Christopher Crossing road within the Association. The west retention basin receives storm water from a series of catch basins, interconnected via a drain line, on Jill Maria Drive and from the clubhouse parking area. The west basin is dry except after the heaviest rainfall events. The north pond is surrounded by a fence and contains a domesticated goose and numerous goldfish. Waterfowl and other wildlife waste in and around the north pond are a potential source of contamination to the water supply. The retention pond also serves as a fire pond for the Association. The north pond appears to been excavated below groundwater elevation and at the time of the site visit contained 6 to 7 feet of water. Maintenance is required for the proper operation of the north pond as a retention basin for storm water.

Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Storm water pollutants such as nitrogen can be found in animal waste, fertilizers and failing septic systems. Surface water related impacts from nitrogen can manifest themselves through algae growth, reduce water clarity and the release of other pollutants. The north pond was observed to have had significant algae growth and poor water clarity.

Recommendations:

- ✓ The north pond and western basin should be inspected at least once per year to ensure that they are operating as designed.
- ✓ At least twice during the growing season, side slopes and embankments should be mowed and accumulated trash and debris removed.
- ✓ Sediments should be removed from the pond as necessary and at least once every ten years.
- ✓ Sweeping streets and parking lot reduces the amount of potential contaminants in storm runoff. It is critical to remove accumulated sediments from the winter months before heavy and frequent spring precipitation, especially with catch basins without deep sumps or from basins that have not been maintained.

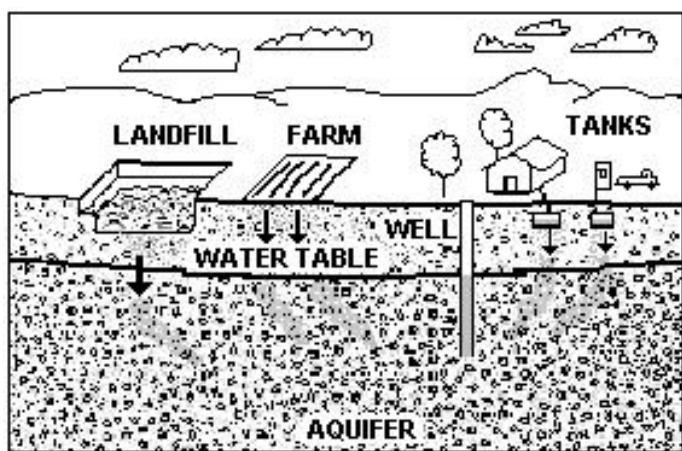


Figure 1: Example of how a well could become contaminated by different land uses and activities.

- ✓ Provide signs and educational materials to residents as to importance of proper disposal of pet waste.
- ✓ Discourage wildlife by prohibiting the feeding of waterfowl and wildlife.
- ✓ Consider structural Best Management Practices (BMPs) to prevent pollution from storm water affecting water quality. Best management practices reduce or prevent pollution from reaching water bodies and control the quantity/quality of runoff from a site (refer to *Storm Water Management Handbook*, volume 1 and 2 for information on structural BMPs located in attachments).
- ✓ Consider testing of surface water in the north pond for concentrations of fecal coliform, nitrate, ammonia, dissolved oxygen, specific conductance and pH.
- ✓ All sediments and hydrocarbons (i.e. Oil/water separators) should be properly handled and disposed in accordance with local, state and federal guidelines regulations. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all Department regulations, policies and guidance.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

2. **Lawn Care and Maintenance**-Over application of pesticides and fertilizers on lawns is a potential source of contamination to the water supply.

Recommendation:

- V Provide educational materials to residents about the proper application of pesticides or fertilizers. Refer to attachment, A Homeowner Guide to Environmentally Sound Lawn Care. Additional information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's web site at <http://www.massdfa.org>.

3. **Septic Systems**-In a Jan. 5, 1989 letter, the Department approved Waterview Associates septic system design plans. The septic system consists of 31 subsurface sewage disposal systems including 14 leaching trenches located within the IWPA. In order to reduce the potential impacts from the septic systems in the public water supply wellhead protection area, the 8 homes closest to the well (southeast corner) have the sanitary waste pumped to a leaching field located on the western edge of the property. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply.

Recommendations:

- V Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
 - V Educate residents on private septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>
 - V Considering previous nitrogen concentrations detected in groundwater and previous microbial problems at the facility, consider having septic system force mainlines checked for leaks by a qualified engineer.
4. **Agricultural**- Approximately, 25 percent of the wellhead protection area is comprised of cranberry bogs which are located southeast of the well. As is the case for most other crops the commercial production of cranberries usually requires input of fertilizer and pesticides. Utilization of best management practices (BMPs) as planned and described in an established conservation farm plan can ensure that agricultural system will uphold the integrity of the surrounding natural resources.

Recommendation:

- V Encourage Cranberry bog owner/operator to:
 1. Obtain and follow an approved USDA, Natural Resource Conservation Service Conservation Farm Plan.
 2. Maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.

3. Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Drinking water protection area signs were posted at key locations at the time of the SWAP site visit. Waterview Associates should review and adopt the **key recommendations** above and the following:

Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Conduct regular inspections of the Zone I. Look for illegal dumping, and evidence of vandalism.
- V Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- V Educate residents on proper application of pesticides and fertilizers.

Facilities Management:

- V Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- V Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- V Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- V Work with local officials in Carver to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Agricultural:

- V Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing fertilizer and pesticide use management issues.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Fertilizer Use Fact sheet
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet
- Storm Water Management Handbook, Volume 1 and 2
- A Homeowners Guide to Environmentally Sound Lawn Care

Source Water Assessment Program (SWAP) Report

For

Shaw's Plaza



Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
March 26, 2001

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Shaw's Plaza
<i>PWS Address</i>	160 North Main Street
<i>City/Town</i>	Carver, Massachusetts
<i>PWS ID Number</i>	4052051
<i>Local Contact</i>	Tim O'Loughlin

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4052051-01G	180	560	High
Well #2	4052051-02G	180	560	High

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. DESCRIPTION OF THE WATER SYSTEM

The Well

Shaw's Plaza is a public water system with two (2) water supply wells currently serving a supermarket and retail space. The wells for Shaw's Plaza are located in an undeveloped meadow on the northern portion of the property. Records indicate the previous land uses of the property consisted of gravel mining and pasture. Well #1 and Well #2 have a Zone I of 180 feet and an Interim Wellhead Protection Area (IWPA) of 560 feet. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

The Zone I is owned and controlled by the public water system and meets DEP's restrictions which only allow water supply related activities in the Zone I. The public water system consists of two (2) six inch bedrock wells completed to depths of 740 feet and 670 feet, respectively. The wells are located in a bedrock aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. There is no emergency backup power to the well pumps. The irrigation and the fire sprinkler system have backflow prevention devices.

The Water Quality

The wells serving the facility have an iron removal treatment system in the form of an U.S. filter unit. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Photo Processor and Small Quantity Generator of Hazardous Waste (SQG)**
2. **Industrial Wastewater Holding Tank**
3. **Storm water**

The overall ranking of susceptibility to contamination for both wells is **High**, based on the presence of at least one **High** threat land use or activity in the IWPA, as seen in Table 2. Implementing the following recommendations will reduce the system's susceptibility to contamination.

Table 2: Table of Activities within the Water Supply Protection Areas

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Photo processor	silver-bearing waste	No	Yes	High	registered with Environmental Results Program at DEP
	Small quantity generator of hazardous waste - SQG	No	Yes	Moderate	photo processor waste - SQG Permit
Pasture	Horse grazing field	No	Yes	Moderate	potential source of microbial contamination
Plaza	Septic System	No	Yes	Moderate	refer to septic systems brochure attached
Hair Salon	Aboveground Storage Tank	No	Yes	Moderate	industrial wastewater holding tank
Residence	Fuel Storage Above Ground	No	Yes	Moderate	heating fuel
Very small quantity generator of waste oil	waste oil	No	Yes	Low	< 27 gallons per month
Plaza	storm water drains/retention basins	No	Yes	Low	subsurface drainage system

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Photo processor and SQG-**The photo processor at this location is registered through the Environmental Results Program as a photo processor and additionally as a small quantity generator of hazardous waste. The Environmental Results Program streamlines existing pollution control requirements for photo processing facilities by replacing individual water pollution control and hazardous waste recycling permits with a minimum statewide silver discharge limit; monitoring; and simplified operating and maintenance rules. Most automated photo processing equipment produces silver-bearing waste.

Recommendations:

- ✓ The photo processor should review its Environmental Results Program certification and the *Photo Processor Environmental Certification Workbook* for photo processor which covers DEP's industrial wastewater management, and hazardous waste management requirements for photo processing operations. The workbook explains the standards, and provides tips on how to comply. Some facilities may be subject to additional state, federal or local environmental standards that are not covered by the ERP compliance certification. The photo processor must still comply with these requirements, even though they are not included as part of the ERP certification.

2. **Industrial Wastewater Holding Tank-**Industrial Wastewater Holding Tank associated with the disposal of salon waste is located within the IWPA. Non sanitary and process flows from hair salons are classified as industrial wastewater and cannot be discharged to the dry wells, storm drain or septic system. If this wastewater was disposed to the ground or to storm drains this might endanger drinking water or surface waters such as lakes, streams and estuaries. In a September 3, 1997 letter, the Department approved plans for the installation of industrial wastewater holding Tank. On August 7, 1997 the Town of Carver certified the system was installed in accordance with provisions of Title 5.

Recommendations:

- ✓ Keep a monitoring log detailing inspections, maintenance and pump outs from the holding Tank on the premises. Monitor and maintain the holding tank in accordance with Department approval letter and Board of Health requirements.

3. **Storm Water-**Storm water from the parking lot is routed to a storm water treatment system consisting of catch basins, oil/water separators, and subsurface detention area prior to discharge to wetlands. There are nine (9) catch basins in the IWPA. Seven (7) catch basins associated with the facilities parking lot and two (2) catch basins are located along route 58.

As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Pollutants are actually not removed from most catch basins until they are cleaned out. Regular maintenance is required to reduce the risk of resuspension of sediments during large storm events. Maintenance is essential for the proper operation of catch basins, oil/water separators and the subsurface detention area.

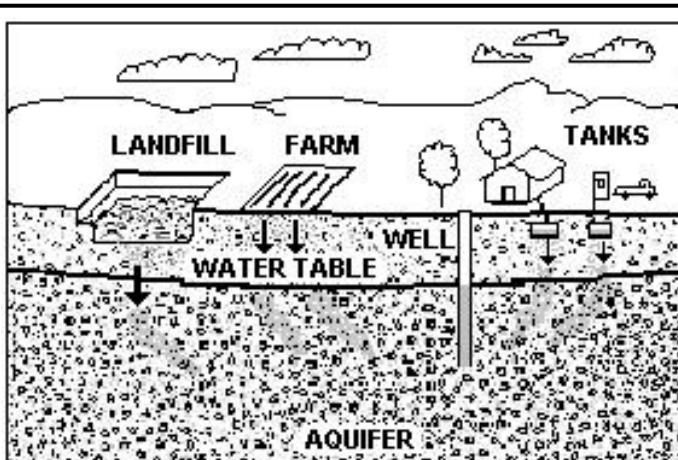


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Recommendations:

- ✓ If you do not have a storm water maintenance plan developed, develop one. Maintenance plans should identify owners, parties responsible for maintenance and inspection and maintenance schedule. Inlets should be cleaned out a minimum of four times per year and inspected monthly. The outfall should be inspected annually. Examination of the outfall discharge for color, turbidity, odor, oil sheen etc. should be recorded.
- ✓ Additionally, street and parking lot sweeping reduces the amount of potential contaminants in stormwater runoff.
- ✓ All sediments and hydrocarbons should be properly handled and disposed in accordance with local, state and federal guidelines and regulations. Catchbasin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all DEP regulations, policies and guidance.

3. PROTECTION RECOMMENDATIONS

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Shaw's Plaza is commended for current protection measures. Shaw's Plaza should continue to implement the following Zone I protection measures:

- ✓ Continue to keep non-water supply activities out of the Zone I.
- ✓ Continue to prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.
- ✓ Continue to conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Continue not to use or store pesticides, fertilizers or road salt within the Zone I.
- ✓

Shaw's Plaza should review and adopt the key recommendations above and the following recommendations:

IWPA:

- ✓ **Very Small Quantity Generator (VSQG) of Waste Oil:** The supermarket at this facility is registered as a VSQG. Refer to the attachment *A Summary of Requirements for Small Quantity Generators of Hazardous Waste* for additional information regarding requirements for VSQG.
- ✓ Consider propane or natural gas for back-up power sources for the well pumps in the future
- ✓ **Above Ground Storage Tanks** -Based upon plans in the Department files, there are at least two (2) AST associated with residences in IWPA. All tanks in close proximity to water supply wells should be upgraded to meet current construction standards. Contact your local fire department for further assistance.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, food preparation staff and any other who handle this material.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.
- ✓

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at <http://www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm>
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property (refer to attachment "Protecting Water Sources from Fertilizer").
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:
www.state.ma.us/dep/brp/dws.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the Public Water Supplier, town boards, the town library and the local media.

Planning:

- ✓ Work with local officials in Plympton and Carver to include Shaw's Plaza IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Agricultural

- ✓ Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing manure management (refer to attachment "Mud and Pasture Management").

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

ATTACHMENTS

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Fertilizer Use Fact Sheet
- Industrial Floor Drains Brochure
- Mud and Pasture Management
- A Summary of Requirements for Small Quantity Generators of Hazardous Waste
- ERP Fact Sheet



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Meadow Woods Mobile Home Park

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date DRAFT Prepared:
July 30, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Meadow Woods Mobile Home Park
PWS Address	2 Catherine Lane
City/Town	Carver, Massachusetts
PWS ID Number	4052054
Local Contact	Paul Parsons
Phone Number	(508) 866-2613

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4052054-01G	220	711	High
Well No. 2	4052054-02G	220	711	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for Meadow Woods Mobile Home Park are located in the southwestern portion of the park. Both Well No. 1 and Well No. 2 are wellfields and each wellfield has a Zone I extending 220 feet from the perimeter well points. Both wells have Interim Wellhead Protection Area radii (IWPA) of 711 feet measured from the center of each wellfield. The IWPAs provide interim protection areas for water supply wells when the actual recharge area has not been delineated. The actual recharge area to the wells may be significantly larger or smaller than the IWPAs. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Both wells are treated with chlorine as a disinfectant. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Residential Land Uses; and,**
3. **Cranberry Bogs**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2. The threat ranking could be lowered to moderate with the removal of all fuel oil/kerosene tanks from the Zone I or the placement of each tank on an impervious surface within a contained area large enough to hold the contents of the tank should a release occur.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains driveways and residences. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Work with residents within Zone I to encourage the replacement of fuel oil or kerosene heat with propane heat and to properly remove the fuel oil/kerosene tanks from the residence if they do convert to an alternate heating source.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct driveway drainage in the Zone I away from the wells.
- ✓ If possible relocate septic systems outside of the Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Driveways/road and parking areas	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	Yes	Yes	High	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Septic System	Yes	Yes	Moderate	See septic systems brochure in the appendix, relocate septic systems outside of Zone I
Lawn care/gardening	Yes	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Cranberry Bogs	No	Yes	Moderate	Fertilizer and pesticide use

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. Residential Land Uses –All of the residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- ✓ **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
- ✓ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- ✓ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- ✓ **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

Implementing the following recommendations will reduce the system’s susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well’s susceptibility to contamination. Meadow Woods Mobile Home Park is

commended for posting the Zone I, having a formal Emergency Response Plan, and for providing wellhead protection education to the residents. Meadow Woods Mobile Home Park should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Encourage the replacement of fuel oil or kerosene heat with propane heat so that oil/kerosene tanks can be removed from the Zone I.
- ✓ If possible relocate septic systems outside of the Zone I.

Zone I:

- ✓ Aboveground storage tanks that can not be removed from your Zone I should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Restrict use of salt within Zone I and drain stormwater away from well.

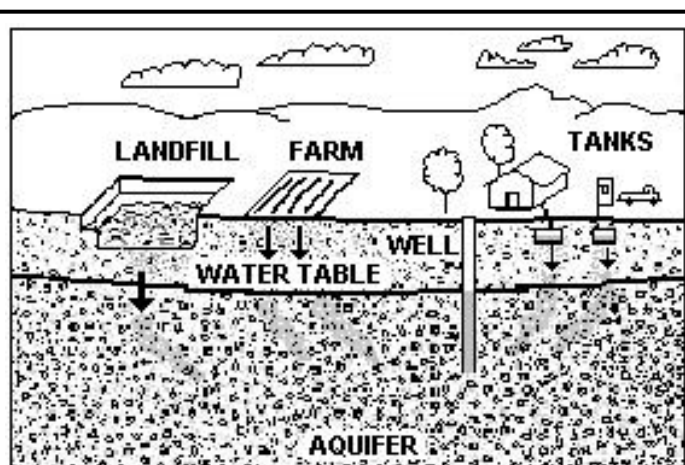


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/ including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I, check any aboveground tanks for leaks.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on park property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

2. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Shops at Carver Crossing

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
March 20, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Shops at Carver Crossing
PWS Address	96 North Main Street
City/Town	Carver, Massachusetts
PWS ID Number	4052057
Local Contact	Peter Bohan
Phone Number	(781) 826-1200 extension 126

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4052057-01G	172	516	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

The Well

The Shops at Carver Crossing is a public water system with a single water supply well currently serving a retail plaza. A replacement well was installed in 1997 due to diminished yield from the original well. The depth of the replacement well is not precisely known since a well log is not available. However, the invoice from the well driller indicates 65 feet of 4 inch well casing and 4 feet of well screen material was used for well construction. Based on this invoice the well is likely screened 60-70 feet below grade. Well #1 has a Zone I of 172 feet and an Interim Wellhead Protection Area (IWPA) of 516 feet. The well is located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of a hydrogeologic barrier that can prevent contaminant

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

migration. Please refer to the attached Map of the Zone I and IWPA.

The Water Quality

The well serving the facility is treated by a limestone contactor. The limestone contactor is designed to raise the pH of the water to reduce its corrosiveness. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. **With the path**

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I**
2. **Stormwater**
3. **Presence of Oil Contamination Sites within the IWPA**
4. **Underground Storage Tanks (USTs) in IWPA**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains a portion of the plaza building and a portion of the access road for plaza deliveries. The public water supplier does not own and/or control all land encompassed by the Zone 1. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ As previously noted in the Department's approval letter for well #1, the Department provided for certain nonconforming uses (ie. a portion of the plaza building, and the driveway for store deliveries) within the protective radius of the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. **Storm Water-** There are seven (7) catch basins associated with the facilities parking

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Below Ground	No	Yes	High	There are two (2) active gasoline stations
Storm water drainage system	No	Yes	Moderate	Subsurface drainage system under parking lot
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage, existing drainage away from well
Landscaping	No	Yes	Moderate	Fertilizer and pesticide use
Oil and/or hazardous material site	No	Yes	*	refer to Appendix 1 and table 1
Septic System	No	Yes	Moderate	Refer to septic systems brochure
Structures	Yes	Yes	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

lot. The catch basins transport storm water from the parking lot, roadway and roof run off to the ground. There are four (4) catch basins located in the main parking lot to collect storm water runoff from the parking lot. Storm water from the catch basins is routed to two 30 ft. by 100 ft. storm water leaching fields located under the main parking lot. Roof runoff from the Plaza is directed to downspouts located around the structure. All downspouts on the north side of the building are directed to the subsurface leaching fields. All other downspouts (southern and western) direct storm water to pavement and/or directly to the ground. Storm water from the eastern side of the parking lot discharges to three (3) leaching catch basins located in a shallow retention basin between the Plaza and Plympton Street. There is one (1) catch basin located along Plympton Street in front of the facility.

As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Pollutants are actually not removed from most catch basins until they are cleaned out. Regular maintenance is required to reduce the risk of resuspension of sediments during large storm events. Maintenance is essential for the proper operation of catch basins and storm water retention structures.

Recommendations:

- ▼ If you do not have a storm water maintenance plan developed, develop one. Maintenance plans should identify owners, parties responsible for maintenance and inspection and maintenance schedule. Inlets should be cleaned out a minimum of four times per year and inspected monthly.
- ▼ Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.
- ▼ All sediments and hydrocarbons associated with oil/water separators should be properly handled and disposed in accordance with local, state and federal guidelines and regulations. Catchbasin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all Department regulations, policies and guidance.

3. **Presence of Oil Contamination Sites within the IWPA** – The IWPA for Well #1 contains a DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Number 4-0000305. The site is a former

gas station location. Refer to the attached map and section 5. Appendix for more information.

Recommendation:

- ▼ Monitor progress on any ongoing remedial action conducted for the known oil contamination site.

4. **Underground Storage Tank (UST)** - There are USTs containing petroleum products located within the IWPA associated with two (2) gas stations located east and southeast of the Plaza. An UST in the IWPA containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel.

Recommendation:

- ▼ Work with Town of Carver and businesses in IWPA to ensure that UST's incorporate proper containment and safety practices.

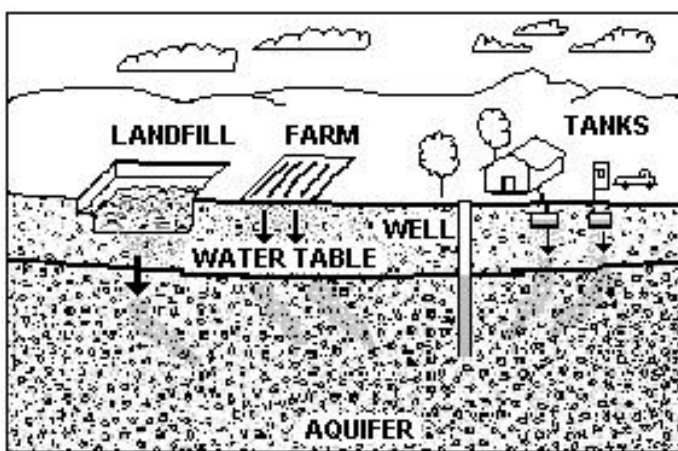


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact **Mark Dakers** in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

available.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well #1 susceptibility to contamination. Shops at Carver Crossing should review and adopt the **key** recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, etc.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.

Planning:

- ✓ Work with local officials in Carver to include the Shops at Carver Crossing IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

5. APPENDIX

APPENDIX 1 – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000305	Route 44 and 58	Carver	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Source Water Assessment Program (SWAP) Report For Carver High School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
April 9, 2001

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Carver High School
<i>PWS Address</i>	60 South Meadow Road
<i>City/Town</i>	Carver, Massachusetts
<i>PWS ID Number</i>	4052064
<i>Local Contact</i>	Paul McDonald, Certified Operator
<i>Phone Number</i>	(508) 866-6138

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4052064-01G	295	844	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Carver High School receives its water from well #1 which is located approximately 700 feet northwest of the main school building. Additionally, well #1 is used for irrigation of approximately 17 acres of playing fields. Well #1 is a 56 foot gravel packed well. The well is located in a wooded area in a well house identified with a sign, "Drinking Water Supply Area". The school owns all the land encompassed by the Zone I. This meets DEP's restrictions, which only allow water supply related activities in the Zone I. Well #1 has a Zone I of 295 feet and an Interim Wellhead Protection Area (IWPA) of 844 feet. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. Emergency power

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

is provided by a diesel fuel generator.

Water quality:

The well serving the facility is treated with potassium hydroxide for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Aboveground Storage Tanks (AST) with diesel fuel; and**
2. **Fertilizer and Pesticide use (Athletic Fields),**
3. **Wastewater Treatment Plant,**
4. **Stormwater Catchbasin,**
5. **Oil/hazardous material storage.**

The overall ranking of susceptibility to contamination for the well is **High**, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

1. **Aboveground Storage Tank (AST)** – There are two (2) 250 gallon diesel AST without secondary containment located in the maintenance area within the school building. The diesel tanks are for the backup generator. If managed improperly, Aboveground Storage Tanks can be a potential contaminant source due to leaks or spills of the chemicals they store.

Recommendation:

- v Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. The Department recommends that you consult with the local fire Department for any additional local code requirements regarding AST. If you need to store fuel for power pumps, the drinking water program recommends that you consider using alternative fuels, such as natural gas or propane.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Storage, use, of oil/ hazardous materials	No	Yes	High	Maintenance area contains fertilizer, fuel storage, lawn equipment, paint, cleaning supplies etc.
Fuel Storage Above Ground	No	Yes	Moderate	Two (2) 250 gallons diesel fuel tanks for backup generator
Athletic Field	No	Yes	Moderate	Fertilizer and pesticide use
Wastewater Treatment Plant	No	Yes	Moderate	Ground water discharge permit
Parking lots & roads	No	Yes	Moderate	Limit road salt usage
Structures	No	Yes	-	

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Fertilizer and Pesticide Use (Athletic Fields)** - A majority of the 17 Acres of Athletic Fields are located in the IWPA for the well. Fertilizer and pesticides used to promote green fields and control weeds, insects and plant diseases have the potential to contaminate the water source.

Recommendation:

- v Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property (refer to Fertilizer and Pesticide use fact sheets attachments).

3. **Waste Water Treatment Plant** - The Carver High school has a wastewater treatment facility located within the IWPA approximately 750 feet southeast of well #1. The discharge for the wastewater treatment plant for the school is located approximately 750 feet to the northwest of the water supply of well. Four (4) monitoring wells surrounding the discharge (infiltration beds) are monitored on a quarterly basis for pH, specific conductance, ammonia, nitrate, chloride, and annually for volatile organic compounds VOCs. All four drains within the building discharge to the wastewater treatment plant. The facility was issued a ground water discharge permit on November 28, 1992 from DEP. The pending permit renewal and plant modifications presently in the planning stages will upgrade the plant to have denitrification capability.

Recommendation:

- v Comply with your ground water discharge permit including but not limited to the effluent limits, monitoring and reporting requirements and supplemental conditions specified in your permit as amended.

4. **Storm Water Catch Basin** - Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- v Work with the Town to have catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff. All sediments and hydrocarbons (i.e. Oil/water separators) should be properly handled and disposed in accordance with

local, state and federal guidelines regulations. Catch basin cleanings are classified as a solid waste and must be handled and disposed of in accordance with all Department regulations, policies and guidance.

5. **Oil/hazardous Materials** - The facility currently participates with the Town of Carver in its household hazardous waste collection to discard many of its spent chemicals. Staff should be trained on proper transportation and disposal of hazardous materials.

Recommendation:

- v Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. Post labels as appropriate on raw materials and hazardous waste. Businesses and agencies that wish to participate at one day hazardous waste collections must preregister with DEP as a very small

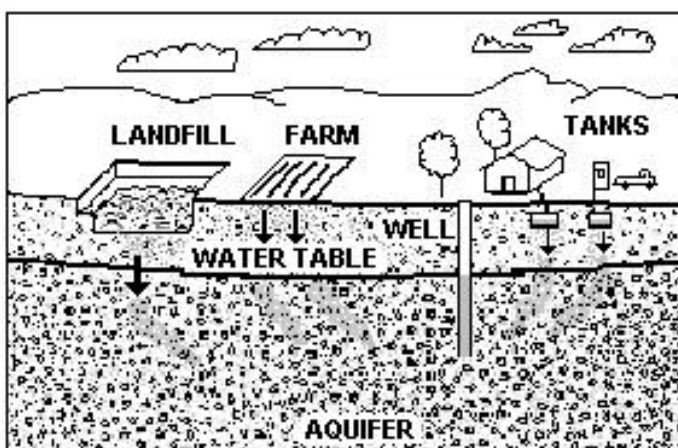


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact **Mark Dakers** in DEP's **Lakeville Office** at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

quantity generator (refer to attachment: *Generator Registration Form*) and must receive a receipt showing the content and quantity of the material and date delivered for their records (refer to attachment: *One Day Hazardous Waste Collection Fact Sheet*).

Other activities noted during the assessment:

A floor drain was observed within the school bus maintenance facility located to the north northeast of the Carver High School well. The floor drain leads to an oil/water separator that is connected to a dry well. The dry well is located just outside of the IWPA but still may pose a threat to the Carver High School well and a more immediate threat to a private well located on the bus maintenance grounds. The floor drain at the bus maintenance facility is a concern due to the storage of gasoline, oil, vehicle storage and maintenance, vehicle washing and other chemical storage. The Department has provided technical assistance to the Town to bring the floor drain into compliance with the Department's Underground Injection Control (UIC) regulations. The Town of Carver is in the final stages of bringing the floor drain into compliance with the Department's regulations.

Implementing the key recommendations above will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Carver High School is commended for its current protection measures. As part of its educational efforts regarding public water supply protection, chemistry lab students are brought to well #1. The Carver High School should review and adopt the **key** recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.

Facilities Management:

- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.

Planning:

- ✓ Work with local officials in Carver to include the Carver High School IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and

incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and

Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- Fertilizer Use Fact Sheet
- Hazardous Waste/Waste Oil Generator Registration Form
- One Day Hazardous Waste Collection Fact Sheet



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Town of Carver

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Town of Carver
<i>PWS Address</i>	108 Main Street
<i>City/Town</i>	Carver
<i>PWS ID Number</i>	4052067
<i>Local Contact</i>	Gerry Farguharson
<i>Phone Number</i>	(508) 866-3460

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

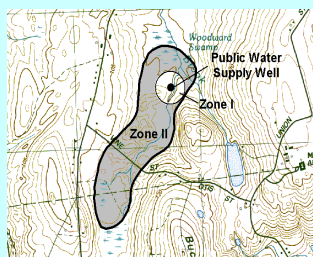
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 562

Susceptibility: High

Well Names	Source IDs
Well No. 1	4052067-01G
Well No. 2	4052067-02G

The Town of Carver supplies water to Cranberry Village Inc. from two groundwater sources. Well No. 1 and Well No. 2 are located north of Cranberry Road and north of Cranberry Village. Each well has a Zone I radius of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Potassium hydroxide is added to the well water for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The land uses for the Zone II for the Town of Carver are predominantly residential and crop land. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Zone I
2. Residential Land Uses
3. Agricultural Activities
4. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I – Each of the Zone Is for Wells No. 1 and No. 2 are circular areas defined by a 400-foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I Activities: The Town of Carver owns or controls all of the Zone I areas. Only water supply activities are allowed within these areas.

Zone I Recommendations:

- ✓ Continue to prevent all non water supply activities from occurring within the Zone Is to comply with DEP's Zone I requirements.

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.

2. Residential Land Uses – Most of the residential areas within the Zone II do not have public sewers, and therefore use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Agricultural Activities – There are cranberry growing operations occurring in southern and southwestern portions of the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

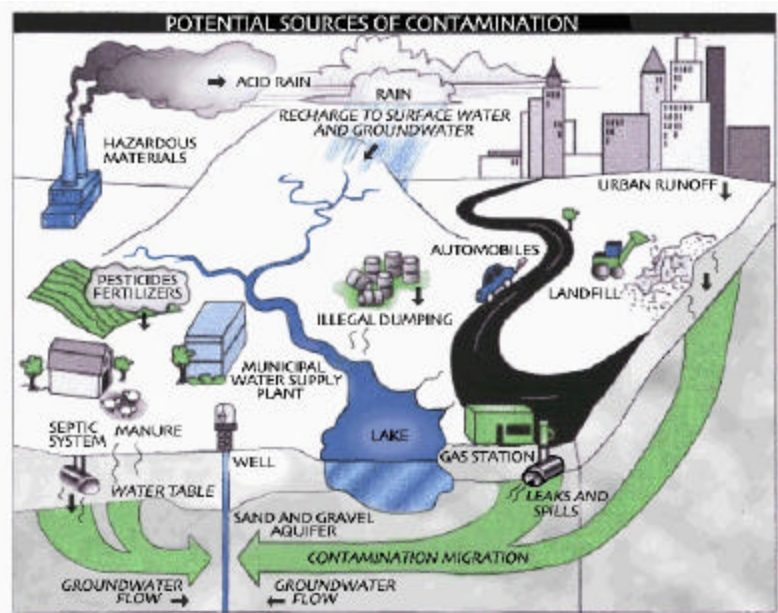
- ✓ Work with cranberry growers in your

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

- ✓ Work with cranberry growers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

4. Protection Planning – Currently, the Town does not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Department staff is available to assist communities in developing local wellhead protection controls.

Protection Planning Recommendations:

- ✓ The Town of Carver should refer to DEP's (1997) manual "Making Wellhead Protection Work in Massachusetts" for an example of a model wellhead protection by-laws. While preparing any wellhead protection bylaws, the town should also review the specific requirements of 310 CMR 22.21 (2) to verify that the proposed by-laws satisfy the regulation requirements.
- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan". For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the Zone II for Well No. 1 and Well No. 2 contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

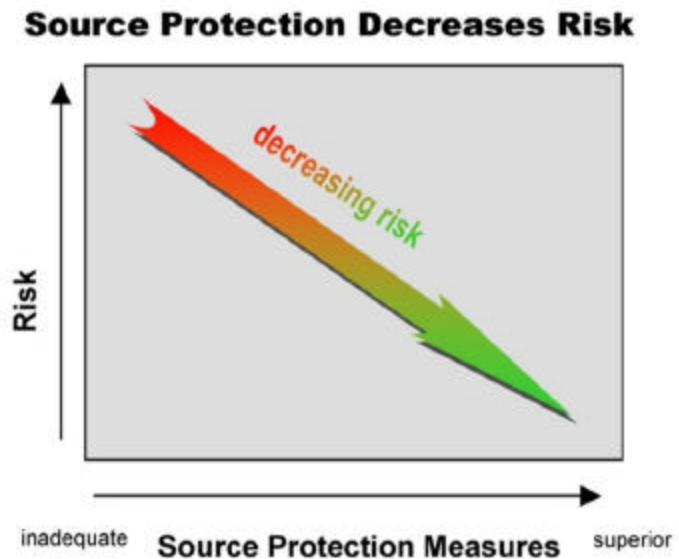


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	some	Moderate	Fertilizers: leaks, spills, improper handling, or over-application (cranberry bog operations)
Pesticide Storage or Use	some	High	Pesticides: leaks, spills, improper handling, or over-application (cranberry bog operations)
Forestry Operations	-	Low	Herbicides and pesticides; equipment maintenance materials: leaks, spills, or improper handling; road building
Residential			
Fuel Oil Storage (at residences)	numerous	Moderate	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	Hazardous chemicals: microbial contaminants, and improper disposal

Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Posting the Zone I area with signs;
- Having gated access to the Zone I area;
- Having a Water Study Committee; and,
- Providing wellhead protection education to residents.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Work with Town officials to develop wellhead protection regulations per 310 CMR 22.21 (2).
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Monitor progress on any future remedial action conducted for oil or hazardous waste contamination sites.
- ✓ Work with cranberry growers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3. Additional source protection documents are provided in Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

A. Additional Documents on Source Protection

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue routine inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue to prevent non-water supply activities from occurring within the Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Work with Town officials to develop local wellhead protection controls per 310 CMR 22.21 (2).
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Work with Rural Community Assistance Program (RCAP) to develop an Emergency Response Plan (978) 297-5300.
Does the municipality have a wellhead protection committee?	YES	
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at cranberry bog uses within the Zone II.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Chatham Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
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Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

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Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Chatham Water Department
<i>PWS Address</i>	127 Old Harbor Road
<i>City/Town</i>	Chatham, Massachusetts
<i>PWS ID Number</i>	4055000
<i>Local Contact</i>	Lynn Van Sant/William G. Redfield
<i>Phone Number</i>	(508) 945-5150

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

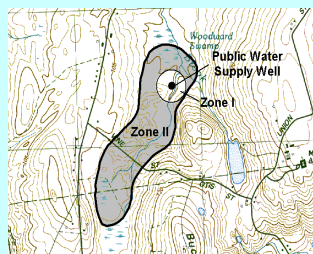
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This report includes the following sections:

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What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 402

Susceptibility: High

Well Names	Source IDs
GP Well #1 South Chatham	4055000-01G
GP Well #2 South Chatham	4055000-02G
GP Well #3 South Chatham	4055000-03G
GP Well #4 Indian Hill Road	4055000-04G
GP Well #5 Training Field Rd.	4055000-05G
GP Well #6 Tirrell's Way	4055000-06G
GP Well #7 Eben's Way	4055000-07G
GP Well #8 Training Field Road	4055000-08G

The Chatham Water Department receives water from eight groundwater wells located within the boundaries of the Town of Chatham. A new well, Town Forest Well #9, is in the final stages of the DEP source approval process and has not been assessed as part of this report. All of the wells are situated in one Zone II (DEP #402) that is located in the towns of Chatham and Harwich. The wells draw from the Monomoy Lens, one of six groundwater lenses that make up the Cape Cod Sole Source Aquifer. Each well has a Zone I of 400 feet. The Chatham wells #1-3, and Training Field Road well #5 are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. a contiguous clay layer) that can prevent contaminant migration into the Zone II. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

Potassium hydroxide is added to all the wells to raise the pH of the water to render it non-corrosive. Wells #3, #5 and #7 have polyphosphate added for sequestering of iron and manganese. Wells #2 and #3 have sodium hypochlorite addition for microbiological control. During spring flushing Wells #5 and #6 also receive sodium hypochlorite treatment. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Chatham is primarily a mixture of forest and residential land uses with small areas of commercial, light industrial and waste disposal land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The seven Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: GP Well #6 Tirrell's Way (4055000-06G) – An electric transmission line runs along the southeastern edge of the Zone I.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 38% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. There are an estimated 2250 private homes in the Zone II, about 1250 in Chatham and 1000 in Harwich. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products

used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

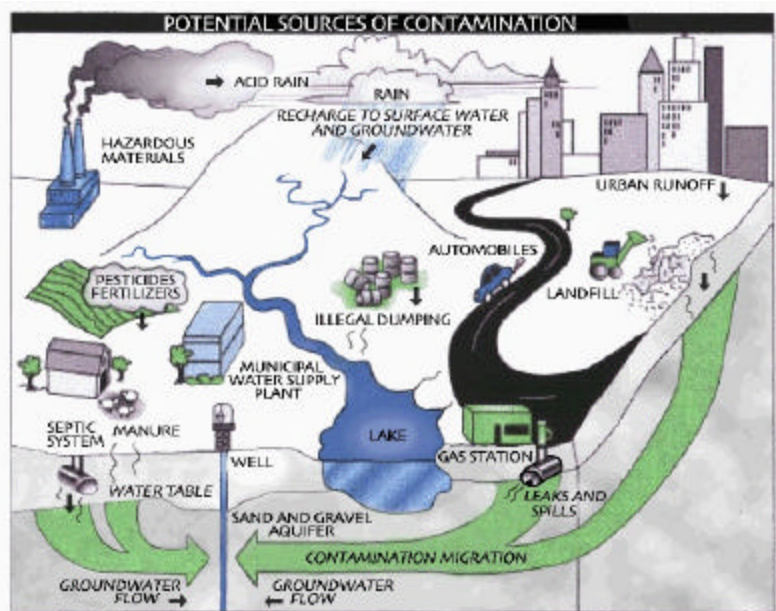
- ✓ Educate residents on best management practices (BMPs) for protecting water

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

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supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors – State roads Rt. 28, Rt. 137 and Rt. 39 run through the Zone II. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use – Three percent of the land area within the Zone II is commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

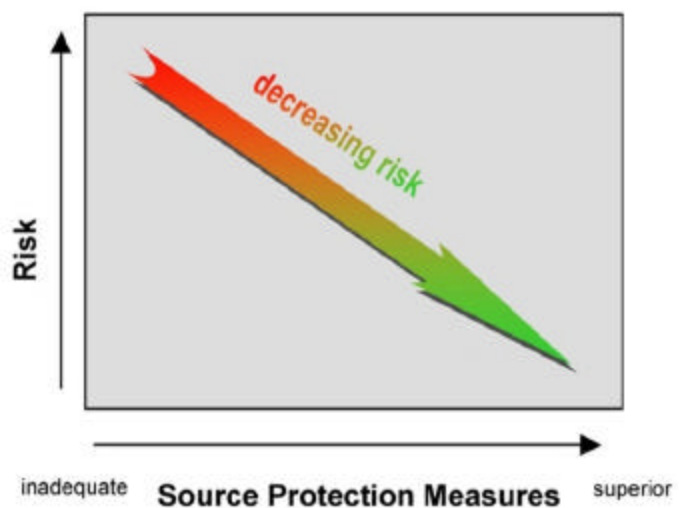


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	3	M	Fertilizers: leaks, spills, improper handling, or over-application
Landscaping	12	M	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Manure Storage	1	H	Manure (microbial contaminants): improper handling
Nurseries	2	M	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	12	H	Pesticides: leaks, spills, improper handling, or over-application
Commercial			
Airports	1	H	Fuels, de-icers, salt, and other hazardous chemicals: spills, leaks, or improper handling
Body Shops	1	H	Vehicle paints, solvents, and primer products: improper management
Gas Stations	1	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Boat Yards/Builders	2	H	Fuels, paints, and solvents: spills, leaks, or improper handling
Cemeteries	1	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Medical Facilities	1	M	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Paint Shops	1	H	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Repair Shops (Engine, Appliances, Etc.)	2	H	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Rust Proofing	1	H	Rust proofing chemicals, solvents, and automotive paint residuals: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial			
Food Processors	2	L	Cleaners, other chemicals, microbial contaminants: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Industrial Continued			
Foundries Or Metal Fabricators	2	H	Solvents and other chemicals: spills, leaks, or improper handling or storage
Industry/Industrial Parks	2	H	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/Metalworking Shops	2	H	Solvents and metal tailings: spills, leaks, or improper handling
Residential			
Fuel Oil Storage (at residences)	Numerous (~ 1125)	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous (~ 2250)	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous (~ 2250)	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aboveground Storage Tanks	2	M	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	numerous	L	Microbial contaminants
Composting Facilities	1	L	Organic material, animal waste, and runoff
Fishing/Boating	3	L	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	Seepage of leachate
Large Quantity Hazardous Waste Generators	1	H	Hazardous materials and waste: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	1	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Very Small Quantity Hazardous Waste Generator	3	L	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	few	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	2	L	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	3	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	~ 22	H	Stored materials: spills, leaks, or improper handling
Waste Transfer/Recycling Station	1	M	Water contacting waste materials: improper management, seepage, and runoff
Wastewater Treatment Plant/ Collection Facility/ Lagoon	1	M	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management

* Notes for Table 2 can be found on page 10.

(Continued from page 4)

facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Agricultural Activities – There are several commercial landscaping and nurseries in the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, manure is a potential source of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with users of pesticides and fertilizers in your protection areas to make them aware of your water supply and to encourage the use of best management practices to protect water supplies.
- ✓ Work with the Board of Health in Chatham to ensure that any manure storage and use within the Zone II employs BMPs to protect the water supply.

6. Protection Planning – Currently, Chatham has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

Protection Planning Recommendations:

- ✓ Continue to use the Chatham Water and Sewer Advisory Committee as a protection team to implement the goals of the Wellhead Protection Plan.
- ✓ Ensure local wellhead protection controls are in compliance with current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Continue reciprocating Zone II protection efforts with Harwich.
- ✓ Use information from this report and the 1984 Potential Source Contamination Survey by Whitman and Howard to develop your own

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



inventory of threats to the water supply. Accurate threat inventories provide essential information to decision-makers at the local and state level.

- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, a gas station, industrial parks, landfills and underground storage tanks. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Chatham meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with Harwich on reciprocal protection of the others Zone IIs.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Continue to implement recommendations contained in Wellhead Protection Plan, use Water and Sewer Advisory Committee to achieve goals.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Water and Sewer Advisory Committee acts as source protection committee. Consider including representatives from citizens' groups, neighboring communities, and the business community in source protection issues.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Chatham's Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Owning and controlling the Zone Is.
- Passing wellhead protection controls that meet 310 CMR 22.21(2).
- Developing a wellhead protection plan.
- Educating consumers and school children on source protection.
- Negotiating reciprocating protection of Zone IIs by Chatham and Harwich.
- Educating realtors on Zone II protection issues.
- In 1994, contracting Whitman and Howard to perform an inventory of potential sources of contamination in Chatham's Zone II.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Initiate a process to update the potential sources of contamination identified in this report and the 1994 Whitman and Howard report.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Notes for Table 2 :

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA**DEP Permitted Facilities**

Fac#	Facility Name	Street	Town	RO#	Old Sys ID	Phone	Type	Class	SWAP Description
33385	KELSEYS AUTO BODY	75 COMMERCE PARK	CHATHAM	157930	MAD980917496	(508) 432-2955	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
35287	CHATHAM WATER POLLUTION CTRL FAC	59 SAM RYDER RD	WEST CHATHAM	158915	MAD981891724	(508) 945-2286	HANDLR	SQG	Small Quantity Generator of Haz Waste
37218	MARITIME EXPLORATIONS INC	114A COMMERCE PARK	SOUTH CHATHAM	160024	MAD985266337	(508) 432-8960	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
40072	TRAXSCAVATING DEMO LANDFILL	MILL HILL LN	CHATHAM	173242	0055.003		DEMO	WOODLF	Woodwaste Landfill
				39153	0055.001		SLF	LF	Landfill
132272	CHATHAM LANDFILL	97 SAM RYDERS RD	CHATHAM	36330	MAD982198269	(508) 945-0757	HANDLR	LQG-MA	Large Quantity Generator of Waste Oil or PCBs
320723	CHATHAM TRANSFER STATION	SAM RYDER RD	CHATHAM	320724			TRSTN	SMTRAN	Transfer Station for Hazardous Material
321398	CHATHAM AIRPORT	240 GEORGE RYDER RD	CHATHAM	321399	MV5089459000		HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
361835	NICKERSON STUMP LANDFILL	160 MILL RD	CHATHAM	361836			STUMP	NONTFR	Air Quality Permit

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
None identified during assessment.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site:

<http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
There are no DEP Tier Classified sites identified within the Chatham Zone II.			

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Menemsha School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Menemsha School
PWS Address	State Road
City/Town	Chilmark
PWS ID Number	4062003
Local Contact	Sylvia Brown – Yeomans
Phone Number	

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	250	750	Modeerate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Menemsha School is located adjacent to the school. The well has a Zone I of 250 feet and an Interim Wellhead Protection Area (IWPA) of 750 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Non-water supply activities in Zone I;**
2. **Livestock operation;**
3. **Residential development; and,**
4. **Road.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of multiple moderate rankings of non-water supply uses within the Zone I and IWPA and the lack of ownership or control of the entire Zone I.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The schools's Zone I contains buildings, a road and two small dirt parking lots. The public water supplier does not own or control all the land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Purchase Zone I property or obtain control of the Zone I through a conservation restriction.
 - ✓ Move vehicle parking out of Zone I, if this is not feasible, pave parking areas and direct stormwater out of Zone I.
 - ✓ If Zone I threats cannot be mitigated consider well relocation.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
2. **Livestock operation** – There is a small livestock (cows) operation within the IWPA. Runoff from livestock operations has the potential to contaminate ground and surface waters.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Road	Yes	Yes	Moderate	Stormwater runoff, spills
Parking lot	Yes	Yes	Moderate	Stormwater runoff, spills
Residential-lawn care	No	Yes	Moderate	Fertilizer and pesticide use
Residential-above ground storage tanks	No	Yes	Moderate	Leaks, spills
Residential-septic systems	No	Yes	Moderate	Bacteria, improper disposal of hazardous materials
Livestock operation	No	Yes	Moderate	Manure (microbial contaminants and nutrients): improper handling
Aquatic wildlife (small pond)	Yes	Yes	Low	Microbial contaminants

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendation:

- ✓ Incorporate best management practices such as vegetated buffers to reduce the risk of impaired water quality from non-water supply activities.
- ✓ Work with cow owners in developing best management practices related to manure management.

3. Residential Development – There is low-density residential development within the IWPA. Activities associated with residential development, which are potential sources of contamination, include lawn and garden care, septic systems and fuel storage.

Recommendation:

- ✓ Use best management practices when applying fertilizers or pesticides within the IWPA.
- ✓ Septic system components should be located, inspected and maintained on a regular basis.
- ✓ Any aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete liquid volume, should a spill occur.

4. Road – Part of State Road is within the Zone I and IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Map stormwater drainage and direct runoff out of Zone I.
- ✓ Maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Menemsha School should work with landowners within the IWPA to reduce the potential for contamination of its drinking water source. School officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Post water supply protections signs in the Zone I and IWPA.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

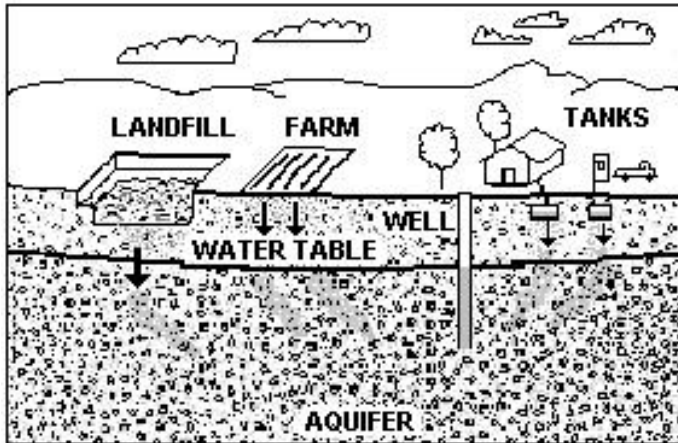


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Chilmark School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
June 16, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Chilmark School
PWS Address	State Road
City/Town	Chilmark Massachusetts
PWS ID Number	4062008
Local Contact	Sylvia Yeomans
Phone Number	(508) 645-2105

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4062008-01G	120	464	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Area to as
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Chilmark School is a public water supply currently serving a population of 65 students and staff. The school is served by Well #1 that is located approximately 250 feet east of the school building in a wooded area. Well #1 is a 4-inch diameter well drilled to a final depth of 70 feet. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (e.g. clay layer) that can prevent contaminant migration. Well #1 has a Zone I of 120 Feet and the Interim Wellhead Protection Area (IWPA) of 464 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well serving the facility has a cation resin type water softer and uses calcium carbonate to reduce corrosiveness of the water by raising the pH. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

Zone I

The Well meets DEP's restrictions that only allow water supply related activities in Zone I. The Zone I protection area is located within a well easement granted to the town by the abutting property owner. The public water supplier controls all land encompassed by Zone I.

Recommendations:

- V Keep non-water supply activities out of the Zone I.
- V Do not use or store pesticides, fertilizers or road salt within the Zone I.

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **An Aboveground Storage Tank (AST) without Secondary Containment,**
2. **Two (2) Aboveground Storage Tanks with Secondary Containment**
3. **Stormwater Catchbasin.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one Moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Aboveground Storage Tank (AST) Community Center**– There is an AST without secondary containment located behind the Community Center building. The AST is located within the IWPA of Well #1. Additionally, the AST is located in close proximity to the Community Centers own public water supply (public water supply ID# 4062006-01G and 02G) wells. If managed improperly, ASTs can be a potential source contamination due to leaks or spills of the chemicals they store.

Recommendations:

- V ASTs in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Above Ground	No	Well #1	Moderate	Heating oil tank for community center
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Field	No	Well #1	Moderate	Fertilizer and pesticide use
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the appendix
Fuel Storage Above Ground	No	Well #1	Low	Heating oil tank with secondary containment
Structures	No	Well #1	-	Non-water supply structures in IWPA

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

spill occur.

- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

2. **Above Storage Tanks in School Basement-** There are two (2) 320-gallons ASTs with secondary containment located within the basement of the Chilmark school

Recommendations:

- ✓ During refilling of AST, ensure that the operator of the oil transport tanker does not leave the vehicle while the AST is being filled.
- ✓ Ensure that the delivery operator has determined the tanks available oil capacity to prevent overfilling (refer to 527 CMR 8.00).
- ✓ Consult with the local fire department for any additional local code requirements regarding USTs.

3. **Storm Water Catch Basin** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendations:

- ✓ Have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce

the well's susceptibility to contamination. Chilmark School should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Drinking water protection signs were not posted at the time of the SWAP site visit. the Department recommends posting drinking water protection signs a key visibility locations. Keep non-water supply activities out of the Zone I.
- ✓ Monitor your water usage. Keep your total water consumption below the 2880 gallons per day to maintain compliance with the calculated Zone I and IWPA.
- ✓ Prohibit public access to the well and pump house by locking facilities, and gating roads.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within

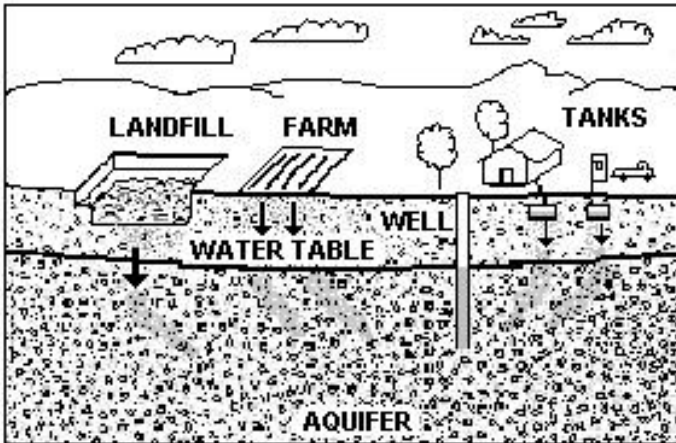


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in Chilmark to include the Chilmark School IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities

are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Fertilizer Use Fact sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Cohasset Water Department

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Cohasset Water Department
<i>PWS Address</i>	339 King Street
<i>City/Town</i>	Cohasset, Massachusetts 02025
<i>PWS ID Number</i>	3065000
<i>Local Contact</i>	George F. Hawksley
<i>Phone Number</i>	(781) 383-0057

Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

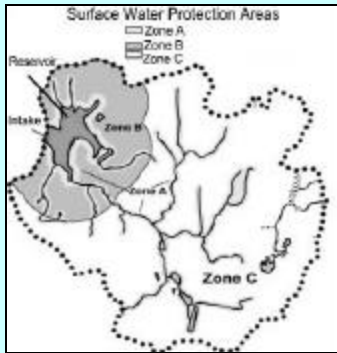
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Section 1: Description of the Water System

Surface Water Sources

Source Name	Source ID #	Susceptibility
Aaron River Reservoir	3065000-01S	High
Lily Pond	3065000-02S	High

The reservoirs for the Cohasset Water Department are located within a continuous water supply protection area, with portions extending into the towns of Hingham, Norwell, and Scituate. The Town is presently seeking to reactivate the Ellms Meadow Wellfield.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

Section 2: Land Uses in the Protection Areas

Cohasset's watershed lands are primarily a mixture of forest and residential land use, with smaller portions consisting of cropland, commercial, and industrial land uses, sand and gravel mining, and other land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone A
2. Residential Land Uses
3. Transportation Corridors
4. Hazardous Materials Storage and Use
5. Agricultural Activities
6. Oil or Hazardous Material Contamination Sites
7. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone A - Land use activities within Cohasset's Zone As which, if managed improperly may have an impact on surface water sources include: numerous homes with on-site septic systems; residential storage of heating oil; local roads; chemical storage; and stormwater runoff. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc.

Zone A Recommendations:

- ✓ To the extent possible, remove all activities from the Zone As to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

Glossary Protection Zones

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Work to better manage stormwater by pre-treating contaminated stormwater and/or redirecting stormwater outside of the Zone A.

2. Residential Land Uses – Approximately 12% of the water supply protection area consists of residential areas. Some of the areas have public sewers, and some use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.

3. Transportation Corridors - State and local roads are common in the water supply protection areas. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

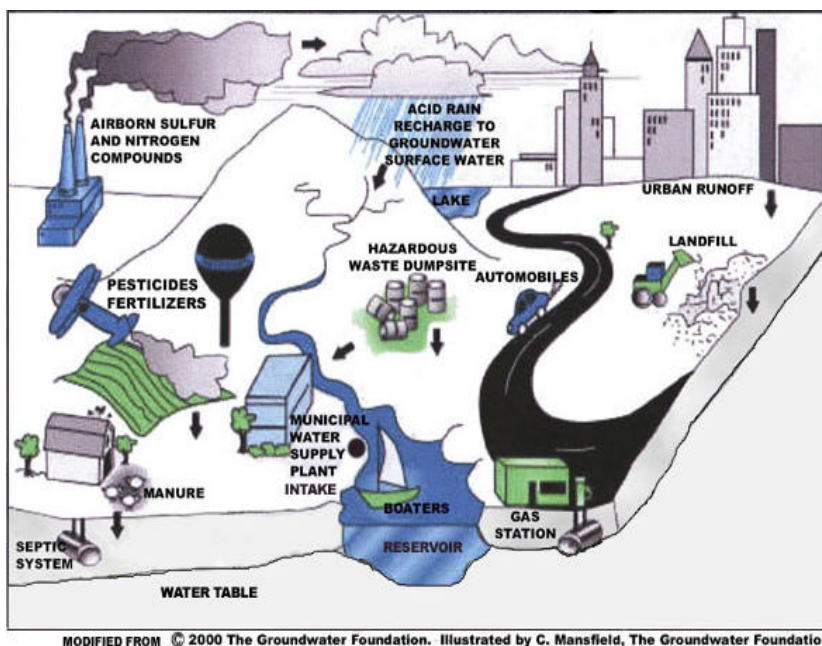


Figure 1: Sample watershed with examples of potential sources of contamination

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include contaminants from automotive leaks, maintenance, washing, or accidents.

Railroad tracks run through the watershed. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Regularly inspect watersheds for illegal dumping and spills.

- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

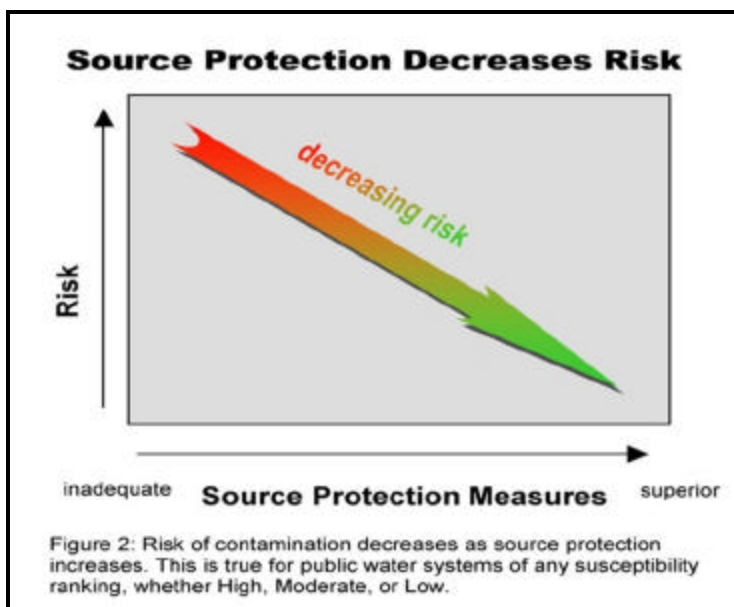
4. Hazardous Materials Storage and Use – A small portion of the water supply protection areas for Cohasset contains commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.

5. Agricultural Activities – Approximately 1% of the water supply protection areas are crop land and pasture land, with other agricultural land uses. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.



Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service (NRCS) farm plan to protect water supplies.
- ✓ Encourage the farmers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. IPM is an ecologically-based approach to pest control that links together several related components, including monitoring and scouting, biological controls, mechanical and/or other cultural practices, and pesticide applications. By combining a number of these different methods and practices, satisfactory pest control can be achieved with less impact on the environment.

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone C Source ID #	Potential Contaminant Sources*
Agricultural				
Nurseries	1	M	01S	Leaks, spills, improper handling, or over-application of fertilizers, pesticides, and other chemicals
Commercial				
Body Shops	1	H	01S	Improper management of vehicle paints, solvents, and primer products
Service Stations/ Auto Repair Shops	2	H	01S	Spills, leaks, or improper handling of automotive fluids, and solvents
Cemeteries	2	M	01S	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids
Repair Shops (Engine, Appliances, etc.)	1	H	02S	Spills, leaks, or improper handling or storage of engine fluids, lubricants, and solvents
Industrial				
Hazardous Materials Storage	2	H	02S	Spills, leaks, or improper handling or storage of hazardous materials
Residential				
Fuel Oil Storage (at residences)	Numerous	M	01S, 02S	Spills, leaks, or improper handling of fuel oil
Lawn Care/ Gardening	Numerous	M	01S, 02S	Over-application or improper storage and disposal of pesticides
Septic Systems/ Cesspools	Numerous	M	01S, 02S	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous				
Aquatic Wildlife	Numerous	L	01S, 02S	Microbial contaminants
Landfills and Dumps	2	H	01S, 02S	Seepage of leachate
Military Facilities (Past And Present)	3	H	01S, 02S	Spills, leaks, or improper handling or storage of pesticides and herbicides, fuel, chemicals and other materials; may include ordnance or waste landfill/dump

Land Uses	Quantity	Threat	Zone C Source ID #	Potential Contaminant Sources*
Miscellaneous				
Oil or Hazardous Material Sites	4	--	01S, 02S	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Depots	1	M	02S	Spills, leaks, or improper handling or storage of de-icing materials, automotive fluids, fuel storage, and other chemicals
Schools, Colleges, and Universities	2	M	02S	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small Quantity Hazardous Waste Generators	1	M	02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/Retention Basins	1	L	02S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way: <u>electric</u>	1	L	01S, 02S	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	1	M	02S	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	1	H	02S	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	2	L	02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Wastewater Treatment Plant/Collection Facility/Lagoon	1	M	02S	Improper handling or storage of treatment chemicals or equipment maintenance materials; improper management of wastewater
Water Treatment Sludge Lagoons	1	M	02S	Improper management of sludge and wastewater
Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

- ✓ Promote Best Management Practices (BMPs) for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Work with farmers and nurseries to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.

6. Presence of Oil or Hazardous Material Contamination Site – The water supply protection area contains four MADEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Numbers 3-0003833, 3-0020078, 3-0020682 and 3-0021613. Refer to the attached map and Appendix C for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.

7. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. The Town of Cohasset amended its Water Resource District Zoning Overlay District, and adopted Zone A land use controls to meet DEP's Surface Water Protection regulations 310 CMR 22.20 (b) and (c). Surface Water Supply Protection Plans coordinate community efforts, identify protection strategies, establish a timeframe for implementation, and provide a forum for public participation. There are resources available to help communities develop plans for protecting drinking water supply sources.

Protection Planning Recommendations:

- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Other land uses and activities within the water supply protection areas that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination.

Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system's watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Mapping storm drains for the purpose of prioritizing locations for Phase II stormwater management.
- Conducting a study on the health of Lily Pond.
- Taking preliminary steps to develop a lawn care program.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Inspect Zone As regularly, and when feasible, remove any prohibited activities.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your watershed and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	Approximately 54% of the combined Zone As is owned or controlled	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. To the extent possible, remove prohibited activities in Zone A to comply with DEP's Zone A requirements.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	NO	Implement daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	NO	Monitor prohibited activities in Zone A, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	Adopted	Submit land use controls to DEP for review and approval. For more information, contact Kathy Romero at (617) 292-5727.
Do neighboring communities protect the water supply protection areas extending into their communities?	Some	Work with the Town of Hingham to include Cohasset's watershed in their protection controls. Submit land use controls adopted by Norwell and Situate to DEP for review.
Planning		
Does the PWS have a local surface water protection plan?	YES	Approved by DEP June 2002. Implement surface water supply protection plan. Follow "Developing a Local Surface Water Supply Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	YES (not active)	Reconvene committee with representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	SOME	Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone C.

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Implement the town's Surface Water Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed and Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

For More Information

Contact Anita Wolovick in DEP's NERO at (617) 654-6535 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

APENDIX A: DEP PERMITTED FACILITIES WITHIN COHASSET WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
340164	BROWNS FOREIGN IMPORTS	574 CHIEF JUSTICE CUSHING HIGHWAY	COHASSET	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
340105	COHASSET IMPORTS INC.	508 CHIEF JUSTICE CUSHING HIGHWAY	COHASSET	HANDLER	VERY SMALL QUANTITY GENERATOR
340105	COHASSET IMPORTS INC.	508 CHIEF JUSTICE CUSHING HIGHWAY	COHASSET	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
5172	COHASSET WATER TREATMENT PLANT	339 KING ST	COHASSET	SURFACE DISCHARGE	SURFACEWATER MINOR

UNDERGROUND STORAGE TANKS WITHIN COHASSET WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
NONE NOTED	--	--	--	--	--

For more information on underground storage tanks, visit the Massachusetts department of fire services web site:

<http://www.state.ma.us/dfs/ust/usthome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities located within the water supply protection area(s) should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Cohasset Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN).

RTN	Release Site Address	Town	Contaminant Type
3-0003833	Leavitt St. - Hingham Annex	Hingham	Oil and Hazardous Material
3-0020078	Doane St.	Cohasset	Hazardous Material
3-0020682	Union St. Wompatuck State Park	Hingham	Hazardous Material
3-0021613	Crocker Lane	Cohasset	Oil

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Dartmouth Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Dartmouth Water Division
<i>PWS Address</i>	751 Allen Street
<i>City/Town</i>	Dartmouth, MA
<i>PWS ID Number</i>	4072000
<i>Local Contact</i>	Steven Sullivan
<i>Phone Number</i>	508-999-0742

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

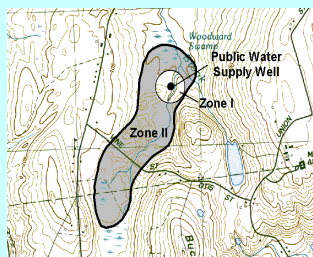
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: A 400 foot to ½ mile radius around a water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II.

Section 1: Description of the Water System

Zone II #: 100

Susceptibility: High

Well Names	Source IDs
Well V1	4072000-05G
Well V2	4072000-08G
Well V3	4072000-07G

Zone II #: 194

Susceptibility: High

Well Names	Source IDs
Well A	4072000-01G
Well B	4072000-02G
Well C	4072000-03G
Well F1	4072000-11G
Well F2	4072000-12G

Zone II #: 195

Susceptibility: High

Well Names	Source IDs
Well D	4072000-06G
Well E1	4072000-09G
Well E2	4072000-10G

IWPA

Susceptibility: High

Well Names	Source IDs
Route 6 Well (inactive)	4072000-04G

The Dartmouth Water Division receives water from 12 wells and purchases water from the New Bedford Water Department. A copy of the SWAP report for the New Bedford Water Department is attached. The 12 wells for the Dartmouth Water Division are located in three Zone IIs and one IWPA, all completely within the town of Dartmouth. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II and IWPA.

The active wells are all disinfected and treated for corrosion control. All wells except wells V1-V3 (Wells 05G, 07G, and 08G) are also filtered for iron and manganese removal. Wells D, E1 and E2 (06G, 09G, and 10G) are treated for removal of volatile organic compounds (VOCs). For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Dartmouth are a mixture of forested and residential land uses, with small areas of sand and gravel mining and commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The twelve Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Each of the protection areas contains some residential land uses. Only a small portion of those areas have public sewers, and so most use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

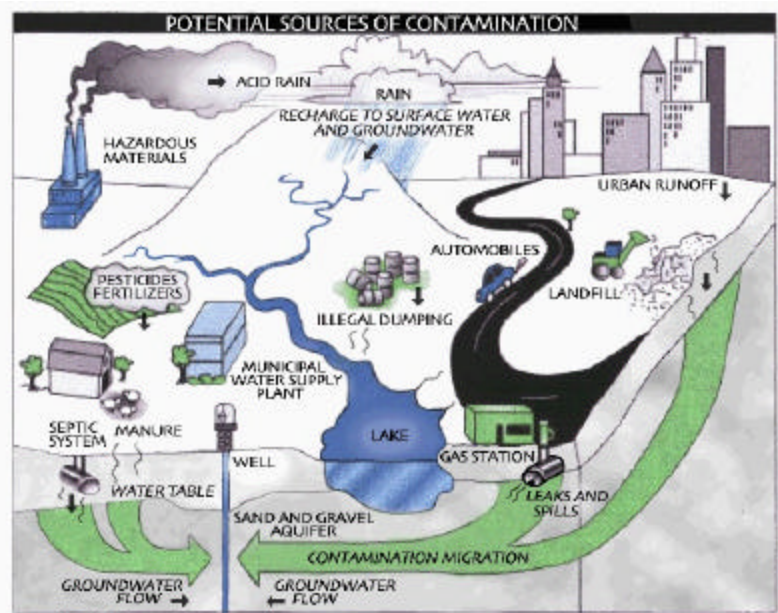
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 6 runs along the northern edge of the Zone II #100 for wells 05G, 07G, and 08G. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation

corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – A small percentage of the land area within the Zone II is commercial or industrial land uses. Many

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

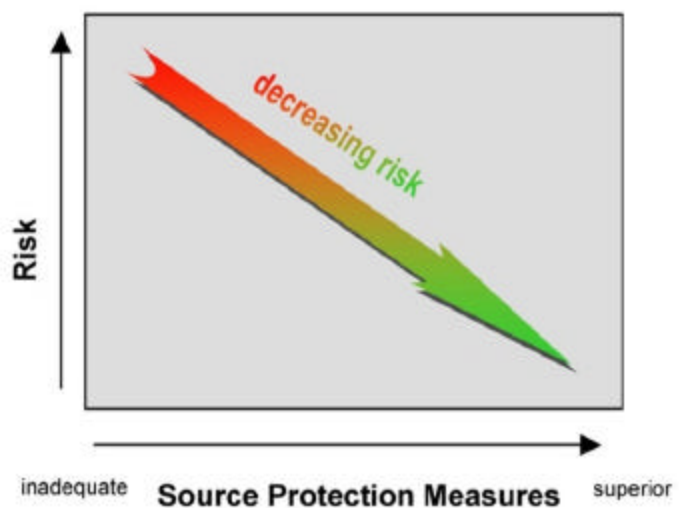


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II, IWPA) - see notes on Page 9

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	2	M	#100, #194	Fertilizers: leaks, spills, improper handling, or over-application
Forestry Operation	1	L	#100	Herbicides or pesticides, equipment maintenance materials: leaks, spills, or improper handling; road building
Landscaping	1	M	#100	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	1	M	#100	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	#100	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Cemeteries	1	M	#194	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Sand And Gravel Mining/Washing	2	M	#100, #194	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Hazardous Materials Storage	1	H	#100	Hazardous materials: spills, leaks, or improper handling or storage
Residential				
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Some	L	All	Microbial contaminants
Clandestine Dumping	Some	H	#195	Debris containing hazardous materials or wastes
Oil or Hazardous Material Sites	2	--	#194, #195	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Water Treatment Sludge Lagoon	2	M	#194, #195	Sludge and wastewater: improper management

(Continued from page 4)

small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-000361, 4-000234. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are agricultural activities within both of the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently the Town has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Keep your Wellhead Protection Plan up to date. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring passive recreation activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	N/A	
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Keep you wellhead protection plan up to date. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

- ✓ DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Working with police to provide regular inspections of gated areas.
- Working with dog walkers within the protection areas to maintain an informal neighborhood watch for the wellhead protection areas.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly, and when necessary, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-000361	CHASE RD LOT 72	DARTMOUTH	Oil and Hazardous Material
4-000234	ROUTE 6	DARTMOUTH	Oil and Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Dennis Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Dennis Water District
<i>PWS Address</i>	80 Old Bass River Rd
<i>City/Town</i>	Dennis, Massachusetts
<i>PWS ID Number</i>	4075000
<i>Local Contact</i>	David Larkowski
<i>Phone Number</i>	(508) 398-3351

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

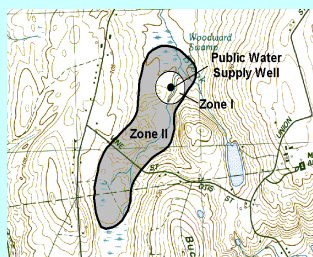
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Susceptibility: High

<i>Zone II #:</i>	<i>Well Names</i>	<i>Source IDs</i>
15	AIRLINE ROAD # 7	4075000-08G
15	AIRLINE ROAD # 8	4075000-09G
15	AIRLINE ROAD # 10	4075000-11G
15	OLD CHATHAM ROAD # 12	4075000-13G
15	OLD CHATHAM ROAD # 1	4075000-02G
15	OLD CHATHAM ROAD # 2	4075000-03G
15	OLD CHATHAM ROAD # 3	4075000-04G
253	WELL #18	4075000-18G
323	WELL #11	4075000-12G
323	WELL #6	4075000-07G
323	WELL #4	4075000-05G
354	PUMPING STATION #19	4075000-19G
354	TEST WELL 92-95	4075000-20G
409	WELL #14	4075000-15G
409	WELL #15	4075000-16G
438	WELL #5	4075000-06G
438	MAIN STATION	4075000-01G
439	WELL #9	4075000-10G
440	WELL #16	4075000-17G

The eighteen wells for the Dennis Water District are located in eight Zone II areas. While all of the wells are located within the Town of Dennis, portions of the Zone II areas extend in to the Towns of Brewster and Harwich. Each of the well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

Water from the wells is pH adjusted for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for the Dennis Water District are a mixture of forested, residential, commercial, and light industrial land uses (refer to attached map for details).

Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Of the eighteen (18) Zone Is for the wells, 11 are entirely owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Main Station 4075000-01G - The main station wellfield Zone I includes the District's headquarters building and vehicle maintenance area, and Route 6.

Well #5 4075000-06G - The Well #5 Zone I includes Route 134.

Well #9 4075000-10G - The Well #9 Zone I includes a few private homes.

Old Chatham Wells #1, #2, and #3 4075000-02G, 03G, and 04G - The Zone I for Old Chatham Wells #1, #2, and #3 include local roads.

Well #4 and Well #11 4075000-05G and 12G - Old Bass River Road passes through the Zone I for the wells.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

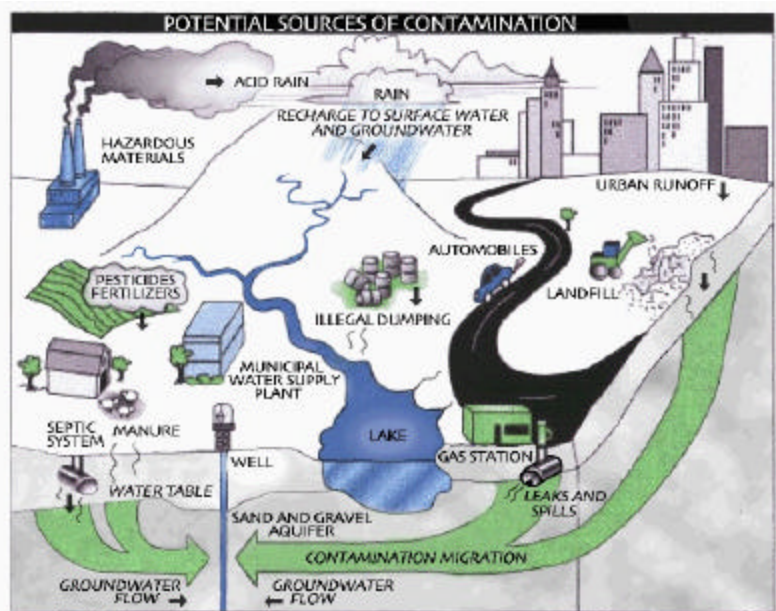
2. Residential Land Uses – Approximately 24% of the total Zone II area consists of residential areas. Most of the areas use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

3. Transportation Corridors - Route 6 and Route 134 run through the Zone II. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially

dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town

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Source Protection Decreases Risk

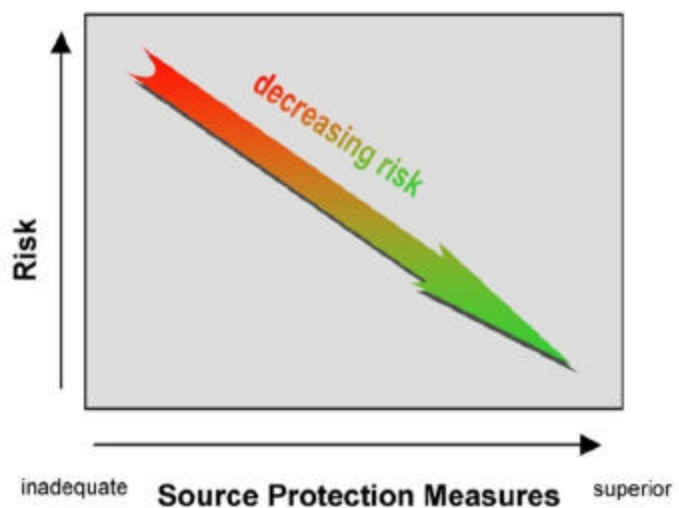


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	#253, #354	Fertilizers: leaks, spills, improper handling, or over-application
Landscaping	1	M	#253, #354	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	#15	Manure (microbial contaminants): improper handling
Pesticide Storage or Use	Few	H	#15, #408, #409, #253,	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Body Shops	2	H	#253, #354, #408, #15	Vehicle paints, solvents, and primer products: improper management
Service Stations/ Auto Repair Shops	3	H	#323, #253, #354	Automotive fluids and solvents: spills, leaks, or improper handling
Boat Yards/Builders	1	H	#253, #354	Fuels, paints, and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	1	H	#15	Fuels and maintenance chemicals: spills, leaks, or improper handling
Golf Courses	2	M	#15, #323, #253, #354,	Fertilizers or pesticides: over-application or improper handling
Laundromats	1	L	#253, #354	Wash water: improper management
Medical Facilities	3	M	#408	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Repair Shops (Engine, Appliances, Etc.)	1	H	#323	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	M	#253, #354, #408, #15	Heavy equipment, fuel storage, clandestine dumping: spills or leaks

*See Table 2 notes on page 10.

Table 2: Land Use in the Protection Areas (Zones I and II) - continued

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Industrial				
Hazardous Materials Storage	1	H	#253, #354	Hazardous materials: spills, leaks, or improper handling or storage: (Plumbing Supply)
Industry/Industrial Parks	2	H	#253, #354, #15	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/Metalworking Shops	1	H	#253, #354	Solvents and metal tailings: spills, leaks, or improper handling
Residential				
Fuel Oil Storage (at residences)	100+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	100+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	100+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	1	M	#253, #354	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Few	L	All	Microbial contaminants
Road And Maintenance Depots	1	M	#15	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	1	M	#15, #439	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	6	M	All	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Many	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	2	L	All except #253	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	1	M	#408, #15	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	2	H	#323, #409	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generators	8	L	All	Hazardous materials and waste: spills, leaks, or improper handling or storage

*See Table 2 notes on page 10

(Continued from page 4)

officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – One percent of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Agricultural Activities - There are several cranberry bogs, a blueberry farm, and horse pasture within the Zone II. The commercial production of these crops usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation

Service farm plan to protect water supplies.

- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses and follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are

(Continued on page 9)

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	SOME	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	SOME	Continue to work with Harwich and Brewster to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Update and augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and residential uses within the Zone II.

(Continued from page 7)

resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, body shops, and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures through:

- Protecting 875 acres of the Zone II areas.
- Working with the town to protect Zone II areas from surrounding towns that extend in to the Town of Dennis.
- Working with the Board of Health to inspect commercial facilities.
- Providing a quarterly newsletter to consumers that includes source protection.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A:

REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
27988	DENNIS EQUIPMENT CO	970 RTE 134	EAST DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
295491	ORLEANS CAMERA AND VIDEO	500 RTE 134 PATRIOTS SQUARE	SOUTH DENNIS	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
33759	RAINBOW AUTOBODY	451 OLD CHATHAM ROAD	DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33888	NORTHSIDE AUTOBODY	360 HOKUM ROCK ROAD	DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
133832	AUTO CARE CENTER	372 HOKUM ROCK ROAD	DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33942	DENNISPORT AUTOMATIC COIN LAUNDRY	13 HALL ST	DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
301511	CAPE AREA TRANSPORTATION SYSTEM	222 OLD CHATHAM RD	SOUTH DENNIS	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
				Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
321421	MIKE & SONS SERVICE CENTER	291 HOKUM ROCK RD	DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
				Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
321423	OTTOWERKS	591 HOKUM ROCK RD	DENNIS	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
				Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
321170	PATRIOTS SQUARE SHOPPING CENTER	492 RTE 134	DENNIS	Groundwater Discharge	Major Groundwater Discharge
321465	DENNIS DPW	30 CROWELL RD	DENNIS	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
321463	PKM GENERAL CONTRACTING	313 HOKUM ROCK RD	DENNIS	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs

For information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
There are no DEP Tier Classified sites identified within the Dennis Zone IIs at this time.			

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Dighton Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Dighton Water District
<i>PWS Address</i>	527 Somerset Ave
<i>City/Town</i>	Dighton, MA 02715
<i>PWS ID Number</i>	4076000
<i>Local Contact</i>	Charles Cestodio
<i>Phone Number</i>	(508) 822-5461

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

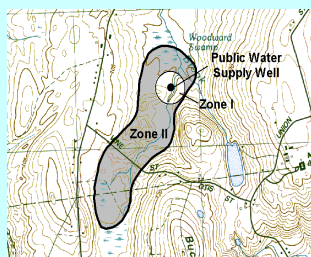
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

IWPA

Susceptibility: High

Well Names	Source IDs
Somerset Ave Well (inactive)	4076000-01G

Zone II #: 545

Susceptibility: High

Well Names	Source IDs
Walker St. GP Well #1	4076000-04G
Walker St. GP Well #2	4076000-05G

Zone II #: 546

Susceptibility: Moderate

Well Names	Source IDs
Cedar St. GP Well #1	4076000-02G
Cedar St. GP Well #2	4076000-03G
Cedar St. GP Well #3	4076000-06G

Dighton Water District receives water from 5 active wells located in the town of Dighton and water purchased from the Taunton Water Department. The SWAP for the Taunton Water Department is attached to this report. The wells from the Dighton Water District are within two Zone II and an IWPA. The Somerset Avenue Well (01G) has been inactive for more than 5 years. The well would therefore need to go through the DEP New Source Approval process prior to reactivation, which would include an assessment of potential sources of contamination. The Zone II # 545 for the Walker St. Wells extends in to the town of Taunton and the Zone II #546 for the Cedar St. Wells extends in to the town of Swansea. Each of the wells has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I, IWPA, and Zone II.

Water from the wells is disinfected and pH adjusted for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and IWPA for the Dighton Water District are primarily forested with areas of residential and agricultural land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Oil or hazardous material contamination sites
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The six Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. There are hayfields and an old cemetery within the Zone I of well 4076000-06G. The water supplier has worked with the farms to ensure that no fertilizers or pesticides are used within the Zone I. There is a local road within the Zone I of well 4076000-02G.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Small portions of the Zone II consist of residential areas. None of the areas have public sewers, and so all use septic

systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

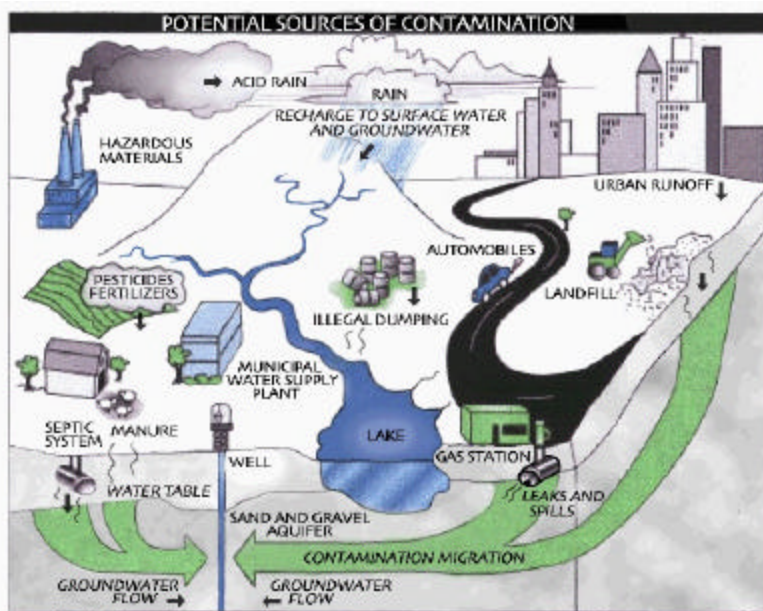
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 44 runs through Zone II #545. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0001317. Refer to the attached map and Appendix B for more

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

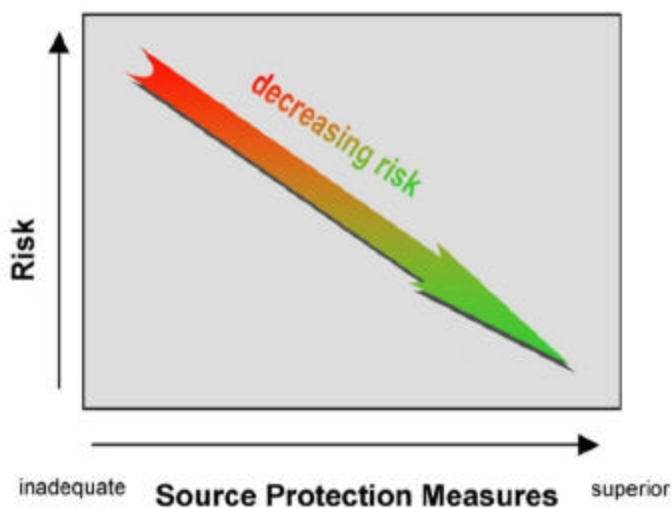


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	#545	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	#545	Manure (microbial contaminants): improper handling
Landscaping	2	M	both	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	1	M	#545	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	#545, IWPA	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Cemeteries	few	M	both	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	2	M	#545	Fertilizers or pesticides: over-application or improper handling
Residential				
Fuel Oil Storage (at residences)	300+	M	both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	300+	M	both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	300+	M	both	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	few	L	both	Microbial contaminants
Oil or Hazardous Material Sites	1	--	#545	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Transportation Corridors	1	M	#545	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Very Small Quantity Hazardous Waste Generator	1	L	#546	Hazardous materials and waste: spills, leaks, or improper handling or storage

*See Table 2 notes on page 9.

(Continued from page 4)

information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

5. Agricultural Activities – There are several farms on the western edge of the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Continue to work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2) requirements for "Best Effort". Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Refer to Table 2 and Appendix A for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better

(Continued on page 8)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone I of well 40760000-06G.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's "Best Effort" requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	SOME	Continue to work with Taunton to include Zone II in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at residential and agricultural uses within the Zone II.

(Continued from page 6)

protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Working with the Town of Taunton to incorporate Dighton Water District Zone II areas in to their Wellhead Protection Controls.
- Continuing to work with the Town of Swansea to incorporate Dighton Water District Zone II areas in to their Wellhead Protection Controls.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

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Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
345528	Borges Foreign Auto Salvage	2200 Lewis Street	Dighton	Generator of Hazardous Waste	Very Small Quantity Generator

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0001317	701 Winthrop Street, Rte 44	Taunton	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Duxbury Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Duxbury Water Department
<i>PWS Address</i>	878 Tremont Street
<i>City/Town</i>	Duxbury, MA 02332
<i>PWS ID Number</i>	4082000
<i>Local Contact</i>	Carl Hillstrom
<i>Phone Number</i>	(781) 934-1103

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

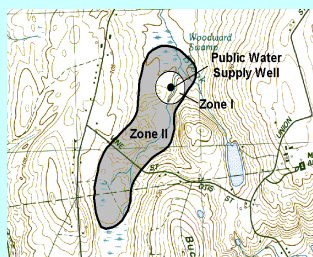
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II#: 133

Susceptibility: High

Well Names	Source IDs
Mayflower St. Well	4082000-09G
Mayflower St. Well #2	4082000-10G

Zone II #: 146

Susceptibility: High

Well Names	Source IDs
Millbrook Pond Well	4082000-01G
Partridge Rd GP Well	4082000-02G
Depot St. GP Well	4082000-03G
Lakeshore Dr. Well	4082000-04G
Tremont Well #1	4082000-05G
Tremont Well #2	4082000-06G
Evergreen Well #1	4082000-07G
Evergreen Well #2	4082000-08G

The wells for the Duxbury Water Department are located in two Zone IIs. Both Zone IIs are almost entirely within the Town of Duxbury, with a very small portion of Zone II # 146 extending in to the Town of Pembroke. Each of the wells has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

Water from all of the wells is pH adjusted for corrosion control and fluoridated for dental health. Well 01G, 03G, 05G, and 06G are also treated for iron removal, Well 07G is treated for manganese removal. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Duxbury Water Department are dominated by forest and residential land uses with smaller areas of commercial and transportation land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use

5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The nine of ten Zone Is for the wells are completely owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Partridge Rd. GP Well 4082000-02G - Residential land uses exist within the Zone I which includes private septic systems.

Zone I: Lakeshore Drive Well 4082000-04G - A local road intersects the Zone I.

Zone I Recommendations:

- ✓ Educate residents within Zone I on proper septic system operation and maintenance.
- ✓ Educate residents within Zone I on proper hazardous materials storage, use and disposal.
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 50% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic

systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

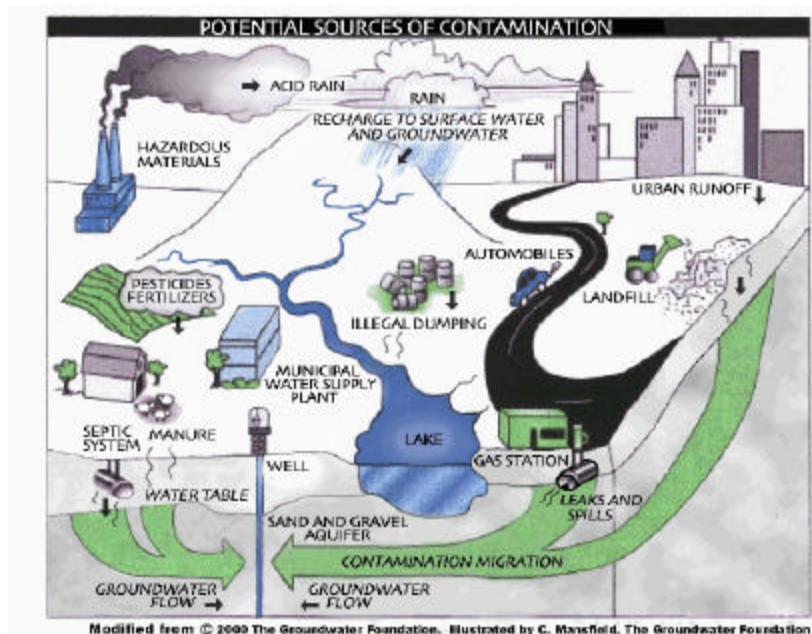
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 3, Route 3A, Route 53, and Route 14 runs through the Zone IIs. Also, local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation

corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – Small areas of the Zone IIs and IWPA are zoned for commercial land use. Activities associated with

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

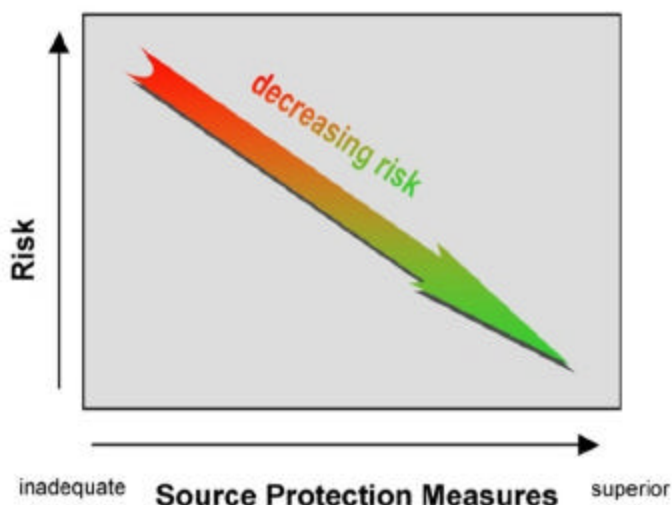


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources*
Agricultural				
Fertilizer Storage or Use	10+	M	Both	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	133	Manure (microbial contaminants): improper handling – Turkey Farm
Pesticide Storage or Use	10+	H	Both	Pesticides: leaks, spills, improper handling, or over-application
Slaughterhouses	1	M	133	Manure and other waste products (microbial contaminants): improper handling – Turkey farm
Commercial				
Car/Truck/Bus Washes	1	L	146	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	1	H	Both	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Golf Courses	1	M	146	Fertilizers or pesticides: over-application or improper handling
Nursing Homes	1	L	133	Microbial contaminants: improper management
Repair Shops (Engine, Appliances, Etc.)	1	H	146	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	25+	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	25+	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	25+	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal

*See Table 2 notes on Page 6.

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources*
Miscellaneous				
Aquatic Wildlife	Several	L	Both	Microbial contaminants
Composting Facilities	1	L	146	Organic material, animal waste, and runoff: storage and improper handling
Landfills and Dumps	1	H	146	Seepage of leachate
Road And Maintenance Depots	1	M	146	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	1	M	133	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way	1	L	146	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	1	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Waste Transfer/Recycling Station	1	M	146	Water contacting waste materials: improper management, seepage, and runoff

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for

more information.

5. Agricultural Activities – There are several active cranberry bogs and one turkey farm within the Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Protection Planning – Currently, the Duxbury does not have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations,

adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone IIs include an old landfill, DPW garage and a school. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES/NO	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is and educate residents in Zone I about BMPs for water supply protection.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Work with Town officials to pass bylaws and regulations required in DEP's 310 CMR 22.21(2). Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The ownership or control of nine of the ten Zone Is for Duxbury.
- Taking an active role in the South Coastal Watershed group.
- Providing water conservation devices to customers.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Establish a Wellhead Protection Committee consisting of members from the Water Department, Town Officials, citizens groups and business groups.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 2

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
30334	FREDS DUXBURY FIXIT SHOP INC	638SUMMER ST	DUXBURY	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37745	DUXBURY CLIPPER	11 S STATION ST	DUXBURY	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37880	OSBORNS COUNTRY STORE INC	632 SUMMER ST	DUXBURY	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37880	OSBORNS COUNTRY STORE INC	632 SUMMER ST	DUXBURY	Fuel Dispenser	Fuel Dispenser
39224	DUXBURY TRANSFER STATION	MAYFLOWER ST	DUXBURY	Transfer Station	Transfer Station for Hazardous Material
39224	DUXBURY DEPT OF PUBLIC WORKS	DUXBURY TRANSFER STATION	DUXBURY	Generator of Hazardous Waste	Small Quantity Generator
39225	DUXBURY LANDFILL	MAYFLOWER RD	DUXBURY	Sanitary Landfill	Landfill
130649	MAYFLOWER CEMETERIES	774 TREMONT ST	DUXBURY	Plant	Air Quality Permit
130649	DUXBURY CEMETERY DEPT	774 TREMONT ST	DUXBURY	Generator of Hazardous Waste	Small Quantity Generator
132613	DUXBURY TOWN OF DPW	878 TREMONT ST	DUXBURY	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
260220	DUXBURY FIRE CENTRAL	668 TREMONT STREET	DUXBURY	Fuel Dispenser	Fuel Dispenser

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
CENTRAL FIRE STATION ID #13203	668 TREMONT ST	DUXBURY	Composite	2 Walls	Interstitial Monitoring	10000	Diesel
			Composite	2 Walls	Interstitial Monitoring	10000	Gasoline
OSBORN'S COUNTRY STORE INC ID #40578	632 SUMMER ST	DUXBURY	Cathodic	2 Walls	Interstitial Monitoring	6000	Gasoline
			Cathodic	2 Walls	Interstitial Monitoring	6000	Gasoline
PHILLIPS TREE REMOVAL INC ID #33864	14R STANDISH ST	DUXBURY	Steel	1 Wall	Inventory Record-Keeping	138 *	Fuel Oil *

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
No DEP Tier Classified Sites were identified within the Zone IIs at the time of assessment.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
East Bridgewater Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	East Bridgewater Water Department
<i>PWS Address</i>	49 Dean Place
<i>City/Town</i>	East Bridgewater, MA 02333
<i>PWS ID Number</i>	4083000
<i>Local Contact</i>	Scott S. McCann
<i>Phone Number</i>	(508) 378-1630

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

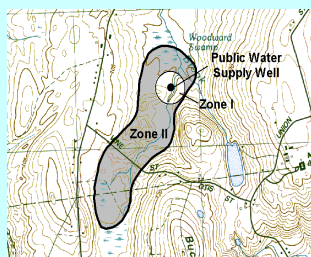
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 73

Susceptibility: High

Well Names	Source IDs
GP Well #5	4083003-05G

Zone II #: 357

Susceptibility: High

Well Names	Source IDs
GP Well #1	4083003-01G
GP Well #2	4083003-02G
GP Well #3	4083003-03G
GP Well #4	4083003-04G

East Bridgewater Department receives its water from five gravel packed type groundwater wells located in two Zone II groundwater protection areas, see above tables. Also, each well has a Zone I protection area of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All water pumped into the system is treated with lime slurry to soften the water, and a Calgon product; C-5 is added to help with a manganese problem. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for East Bridgewater are dominated by a mixture of forest and residential land uses with smaller areas of agricultural, commercial, and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking

Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The five Zone Is for the wells are owned or controlled by East Bridgewater. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land uses are common throughout the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and

contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

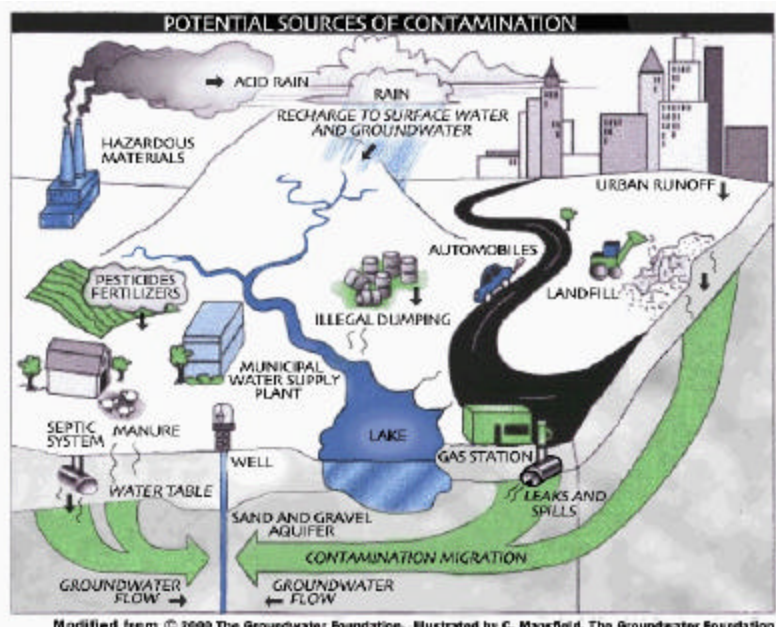
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/>

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



nonpoint.htm.

3. Transportation Corridors - Routes 18, 27 and 106 run through the Zone IIs. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run through the water supply protection areas. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins of DEP's Southeast Regional Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

4. Hazardous Materials Storage and Use -

Commercial and industrial land uses are present in both Zone IIs. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business

(Continued on page 7)

Source Protection Decreases Risk

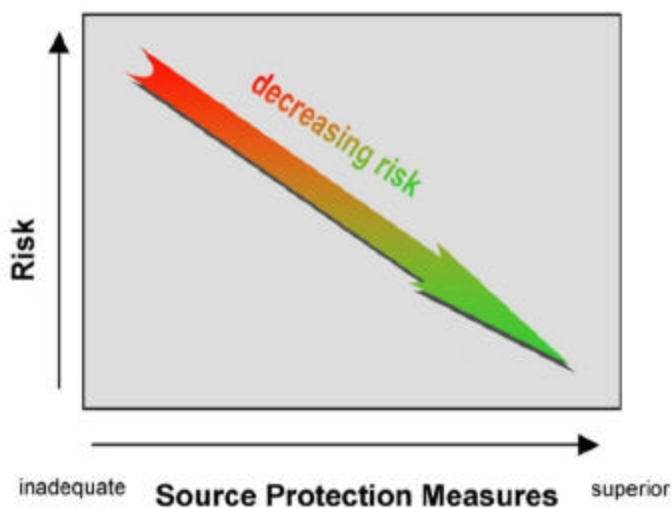


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Dairy Farms	1	M	357	Manure (microbial contaminants): improper handling
Livestock Operations	1	M	357	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	1	H	357	Manure (microbial contaminants): improper handling
Nurseries	1	M	73	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Commercial				
Car/Truck/Bus Washes	1	L	357	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Body Shops	3	H	73	Vehicle paints, solvents, and primer products: improper management
Gas Stations	5	H	Both	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	few	H	Both	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	2	M	73	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	2	H	Both	Solvents and wastes: spills, leaks, or improper handling
Funeral Homes	1	L	73	Hazardous chemicals: spills, leaks, or improper handling
Laundromats	2	L	Both	Wash water: improper management
Nursing Homes	1	L	73	Microbial contaminants: improper management
Paint Shops	3	H	73	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage
Photo Processors	1	H	73	Photographic chemicals: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Commercial Continued				
Railroad Tracks And Yards	2	H	Both	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals:
Hairdressers	1	M	73	Improper disposal of chemicals to septic systems.
Industrial				
Chemical Manufacture Or Storage	1	H	73	Chemicals and process wastes: spills, leaks, or improper handling or storage
Electroplaters	1	H	73	Solvents and other chemicals: spills, leaks, or improper handling or storage
Foundries Or Metal Fabricators	1	H	73	Solvents and other chemicals: spills, leaks, or improper handling or storage
Fuel Oil Distributors	1	H	357	Fuel oil: spills, leaks, or improper handling or storage
Jewelry or Metalplating	1	H	73	Solvents, other chemicals, and process wastes: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	Numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	1	M	357	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Some	L	Both	Microbial contaminants
Clandestine Dumping	Occasional	M	Both	Debris containing hazardous materials or wastes
Fishing/Boating	2	L	Both	Fuel and other chemical spills, microbial contaminants
Oil or Hazardous Material Sites	7	--	Both	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites
Road And Maintenance Depots	1	M	73	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	2	M	73	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or
Small quantity hazardous waste	1	M	73	Hazardous materials and waste: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Miscellaneous Continued				
Stormwater Drains/ Retention Basins	Numerous	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type:	1	L	357	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Numerous	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	17	H	Both	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	2	L	Both	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste	8	L	Both	Hazardous materials and waste: spills, leaks, or improper handling or storage

Notes for Table 2:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and ground-water.

(Continued from page 4)

issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000526, 4-0000594, 4-0000781, 4-0000860, 4-0012369, 4-0012940, 4-0013087 and 4-0014476. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – The Zone IIs contain several agricultural activities that include dairy operations, livestock operations, nurseries and cranberry bogs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, the Town does not meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). To meet DEP's requirements East Bridgewater must submit copies of its local bylaws, overlay district maps and floordrain regulations to DEP for approval. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Expand the Town's protection team to include representatives from local businesses, citizen's groups and other interested groups. Use the protection committee to implement the long term goals of your Wellhead Protection Plan.
- ✓ Coordinate efforts with local officials to ensure local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.



Other land uses and activities within the Zone II include auto repair shops, gas stations, dry cleaners, electroplaters, foundries and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce

(Continued on page 10)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	East Bridgewater does not currently meet DEP's source protection requirements found in 310 CMR 22.21(2). To meet the requirements the Town must submit copies of bylaws, overlay maps and floordrain regulations to the DEP for formal approval.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring municipalities to improve Zone II wellhead protection controls of all towns.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use the Wellhead Protection Committee to implement goals of Wellhead Protection Plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES/NO	Water Commissioners act as current committee. Establish a committee that includes representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at agricultural, commercial, industrial and municipal uses within the Zone II.

the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership of all five Zone Is.
- Coordinating protection efforts with neighboring communities.
- Developing a Wellhead Protection Plan.
- Providing source protection education that includes the local school system.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections.
- ✓ Continue and expand source protection education, target residents, businesses and farmers.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
798	RIDDERS SEPTAGE	OAK STREET	EAST BRIDGEWATER	Ground Water Facility (BRP)	Groundwater Discharge
27984	COLLINS CRANE & RIGGING SERVICE INC	408 SPRINGS ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
27985	TOWNE CLEANERS	5 W UNION ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
29385	PRECISE ENGINEERING INC	24 W UNION ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33401	EJM AUTO	556 BEDFORD ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33729	BATTIS AUTO BODY	26 N CENTRAL ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
35820	EAST BRIDGEWATER TOWN OF D P W	101 WILLOW AVE	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
130652	MUELLER CORP	530 SPRING ST	EAST BRIDGEWATER	Plant	Air Quality Permit
130652	MUELLER CORP	530 SPRING ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Small Quantity Generator
130652	MUELLER CORP	530 SPRING ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
130652	MUELLER CORP	530 SPRING ST	EAST BRIDGEWATER	Sewer Connection or Groundwater Discharge	Industrial Waste Water Holding Tank
136920	CUMBERLAND FARMS INC #2424	143 BEDFORD ST	EAST BRIDGEWATER	Fuel Dispenser	Fuel Dispenser
137315	CUMBERLAND FARMS #2074	1055 WASHINGTON ST	EAST BRIDGEWATER	Fuel Dispenser	Fuel Dispenser
209008	COUNTRY CONVENIENCE INC	210 POND ST	EAST BRIDGEWATER	Fuel Dispenser	Fuel Dispenser

DEP Permitted Facilities Continued

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
226431	CARLS (ALMEIDA) AUTO BODY	42 R NO CENTRAL ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
307503	EAST BRIDGEWATER PRIME	49 CENTRAL ST	EAST BRIDGEWATER	Fuel Dispenser	Fuel Dispenser
325962	ALLOY CASTINGS CO INC	151 W UNION ST	EAST BRIDGEWATER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
A L PRIME ENERGY INC ID #535	49 CENTRAL ST	EAST BRIDGEWATER	Cathodic	2 Walls	Interstitial Monitoring	6000	Gasoline
			Cathodic	2 Walls	Interstitial Monitoring	5000	Gasoline
			Cathodic	2 Walls	Interstitial Monitoring	5000	Gasoline
ALVIN HOLLIS & CO ID #28424	444 WALNUT ST	EAST BRIDGEWATER	Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
COUNTRY CONVENIENCE STORE ID #13250	210 POND ST	EAST BRIDGEWATER	Cathodic	1 Wall	Approved In- Tank Monitor	4000	Gasoline
			Cathodic	1 Wall	Approved In- Tank Monitor	4000	Gasoline
			Cathodic	1 Wall	Approved In- Tank Monitor	2000	Gasoline

Underground Storage Tanks Continued

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
CUMBERLAND FARMS #2074 ID #13245	1055 WASHINGTON ST	EAST BRIDGEWATER	Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	6000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	6000	Gasoline
CUMBERLAND FARMS #2424 ID #18684	143 BEDFORD ST	EAST BRIDGEWATER	Reinforced	1 Wall	Approved In- Tank Monitor	8000	Gasoline
			Reinforced	1 Wall	Approved In- Tank Monitor	8000	Gasoline
			Reinforced	1 Wall	Approved In- Tank Monitor	8000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000526	210 POND ST	EAST BRIDGEWATER	Oil
4-0000594	24 WEST UNION ST	EAST BRIDGEWATER	Oil and Hazardous Material
4-0000781	1615 MAIN ST RTE 27	HANSON	Hazardous Material
4-0000860	49 CENTRAL ST	EAST BRIDGEWATER	Oil
4-0012369	4-6 WEST UNION ST	EAST BRIDGEWATER	Oil
4-0012940	36 COOK ST	EAST BRIDGEWATER	Hazardous Material
4-0013087	COOK ST	EAST BRIDGEWATER	Hazardous Material
4-0014476	498 BEDFORD ST	EAST BRIDGEWATER	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Whispering Pines Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
April 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Whispering Pines Condominiums
PWS Address	2221 State Highway
City/Town	Eastham
PWS ID Number	4086011
Local Contact	Lynn Klokman/Russell Tierney (Certified Operator)
Phone Number	(508) 481-6659/(888) 377-7678

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	166	495	Moderate
Well #2	01G	166	495	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for the Whispering Pines Condominiums are located in a wooded area west of the condominiums, see attached map. Well #1 has a Zone I of 166 feet and an Interim Wellhead Protection Area (IWPA) of 495 feet. Well #2 has a default Zone I of 166 feet and an IWPA of 495 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone Is;**
2. **above ground storage tanks (AST) with heating oil;**
3. **septic systems;**
4. **residential development; and**
5. **local roads and vehicle parking.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate rankings of non-water supply uses within the protection area and the lack of ownership or control of the entire Zone I areas.

1. **Zone Is** – Currently, the wells do not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The Whispering Pines Condo's Zone Is contains residential uses and the public water supplier does not own or control all the land encompassed by the Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Educate residents about water supply protection issues.
2. **Aboveground Storage Tanks (ASTs)** – ASTs with heating fuel can contaminate groundwater if improperly managed and spills or leaks occur.
- #### Recommendation:
- ✓ Inspect and maintain tanks to prevent leaks and spills

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Septic systems and cesspools	Yes	Yes	Moderate	Bacteria, viruses, and nitrate. Improper disposal of hazardous materials
Local roads and parking	Yes	Yes	Moderate	Stormwater runoff, spills
Lawns	Yes	Yes	Moderate	Fertilizer and pesticide use
Above ground storage tanks	Yes	Yes	Moderate	Leaks, spills
Residential development	Yes	Yes	Moderate	Runoff from lawns, septic systems, underground/above ground storage tanks

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ Install containment structures designed to hold 110% of the tanks contents.

3. Septic Systems – There are approximately twenty residential structures located in the IWPA and all use septic systems or cesspools for sanitary waste disposal.

Recommendation:

- ✓ Never dispose of household hazardous materials down drains leading to septic systems or cesspools.
- ✓ Septic system components should be inspected and maintained on a regular basis.

4. Residential Development – There is medium density residential development within the IWPA.

Recommendation:

- ✓ If possible, contact residents in the IWPA about water supply protection.
- ✓ Ensure to educate residents on proper storage, use and disposal of household hazardous materials including fertilizers and pesticides.

5. Local roads and vehicle parking – Local roads and vehicle parking exist throughout the IWPA. Accidents, spills and leaks from vehicles are all potential contaminant sources to groundwater wells.

Recommendation:

- ✓ Continue to maintain contact with the Fire Department about spills.
- ✓ Ensure that stormwater drainage is directed away from the wellheads.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination.

Priority Recommendations:

Zone I:

- ✓ Ensure no cesspools exist within the Zone I.
- ✓ Keep additional non-water supply activities out of the Zone I.

- ✓ Whenever possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Post water supply protections signs in the Zone I and IWPA.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

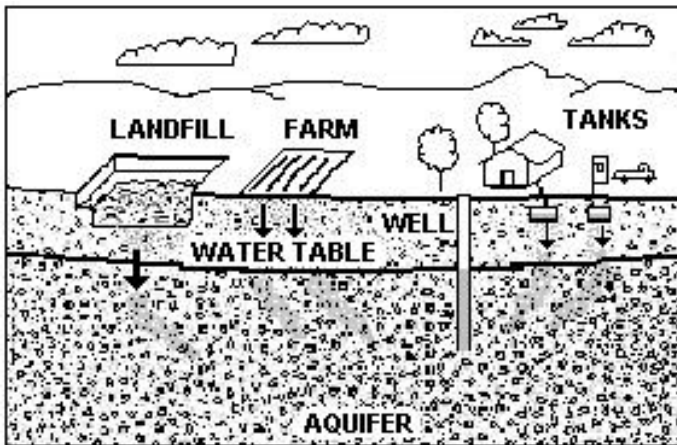


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/ including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Training and Education:

- ✓ Train all staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Inspect and maintain the integrity of the ASTs and ensure all are properly contained.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in an Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

6. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Nauset, Inc.

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May 6, 2003

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Nauset, Inc.
<i>PWS Address</i>	425 Massasoit Rd
<i>City/Town</i>	Eastham, Massachusetts
<i>PWS ID Number</i>	4086044
<i>Local Contact</i>	Jeff Glanville
<i>Phone Number</i>	(508) 255-3899

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4086044-01G	100	420	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Nauset Inc. is a commercial facility that provides day services and job skills training for adults with disabilities. The well for Nauset, Inc is located next to the commercial facility. Well #1 has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 420 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Underground and Aboveground Storage Tanks (AST) With Heating Oil;**
3. **Auto Repair and Boat Yard; and**
4. **Residential Septic Systems.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains a dumpster, facility buildings, parking areas, and a residence. While the facility is a commercial operation, it does not handle, store, or dispose of hazardous materials. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ As feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ As feasible, move the dumpster outside the Zone I. If removal isn't feasible at this time, use containment and Best Management Practices (BMPs).
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Below Ground	No	Yes	High	Stored materials
Auto Repair, Service Station	No	Yes	High	Automotive fluids, paints, and solvents
Boat Yards, Builders	No	Yes	High	Fuels, paints, and solvents
Nurseries	No	Yes	Moderate	Fertilizers, pesticides, and other chemicals
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Septic System	Yes	Yes	Moderate	See septic systems brochure in the appendix
Fuel Storage Above Ground	Yes	Yes	Moderate	Is on impervious surface with containment
Stormwater Drains/ Retention Basins	No	Yes	Low	Debris, pet waste, and chemicals in stormwater from roads and parking lots
Structures, Dumpster	Yes	Yes	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ If the facility intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

2. **Underground and Aboveground Storage Tanks (UST and AST)** – There are tanks located within the IWPA. If managed improperly, tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Upgrade **all** oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the UST and AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs and ASTs.

3. **Auto Repair and Boat Yard** – There is auto repair and boat repair within the IWPA. If managed improperly, the engine fluids, vehicle paints, and solvents usually found at these types of operations can be potential sources of contamination due to leaks or spills.

Recommendations:

- ✓ Educate the facilities about the location of the well and IWPA.
- ✓ Encourage the facilities to use BMP's for the storage, handling, and disposal of all hazardous chemicals.

4. **Residential Septic Systems** – There are residential areas within the IWPA that use septic systems for sanitary sewage disposal. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Educate residential neighbors about the location of the well and IWPA.

- ✓ Educate residential neighbors on the proper disposal of spent household chemicals.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Nauset, Inc. should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep new non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be

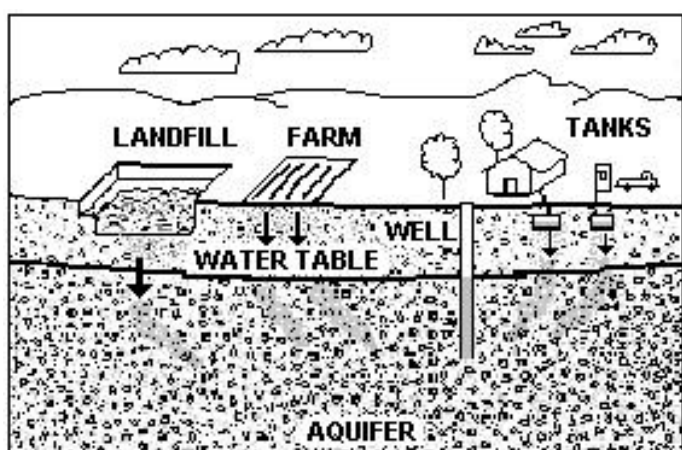


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

mitigated.

- ✓ Prohibit public access to the well and pumphouse by locking facilities, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.
- ✓ The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your status and regulatory requirements.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Children's Place Preschool

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
December 5, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Children's Place Preschool
PWS Address	Forests Ave.
City/Town	Eastham, Massachusetts
PWS ID Number	4086051
Local Contact	Catherine McCauley, Executive Director
Phone Number	508 240-3310

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4086051-01G	150	444	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Area

1. Description of the Water System

Children's Place Preschool is a public water supply currently serving a population of 120 students and staff. The school is served by Well #1, which is located in a wooded area northwest of the school. Well #1 is a 4-inch diameter well drilled to a final depth of 35 feet. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Well #1 was approved by the Department in a letter dated November 16, 1995 after completing the new source approval process. The average daily withdrawal for the well is limited to 2000 gallons per day, based on the current Zone I of 150 feet and Interim Wellhead Protection Area (IWPA) of 444 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1

2. Discussion of Land Uses in the Protection Areas

Zone I

The well meets DEP's restrictions that only allow water supply related activities in Zone Is. The public water supplier owns and/or controls all land encompassed by Zone I. The facility's Zone I is comprised entirely of forested woodland.

Recommendations:

- ✓ Monitor your water usage. Keep your total water consumption below the average of 2000 gallons per day to maintain compliance with the calculated Zone I and IWPA protective radii.
- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Residential Land use,**
2. **Septic systems, and**
3. **Landscaping and Lawn Care.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one Moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Residential Land Use** - If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. The septic system leaching fields for residential

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Residential	No	Well #1	Moderate	Septic systems, fuel storage, fertilizer and pesticide use
Storage, and use of hazardous materials	No	Well #1	Moderate	Very small quantities of cleaning supplies
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Landscaping and Lawn care	No	Well #1	Moderate	Fertilizer and pesticide use
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the appendix
Structures	No	Well #1	-	School buildings

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

homes are located within the IWPA. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Fertilizers and pesticides contain hazardous chemicals that can travel through the soil and contaminate ground water if over-applied. Pet waste may contain bacteria, parasites, or viruses that are a health risk. Water supplies may also be threatened from improper use and disposal of chemical products used in homes or businesses. Educating residents and businesses on proper disposal of these materials is the best defense against pollution.

Recommendations:

- ✓ Proper Household Hazardous Waste Disposal - Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly - not in septic systems. Encourage residents to participate in Household Hazardous Waste Collection days or centers. Educate residents on septic systems about proper disposal practices. Refer to <http://www.state.ma.us/dep/brp/files/yoursyst.htm> for additional information. .
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Encourage residents to upgrade fuel oil storage tanks to incorporate proper containment and safety practices. The Department recommends that residents have the components of their heating system inspected, maintained and replaced or upgraded regularly. Oil lines should be inspected (i.e. furnace to tank) for corrosion or pitting and copper lines should be replaced with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks (refer to attachments). Any modifications must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements.
- ✓ Provide educational materials to residents about the proper application of pesticides or fertilizers on lawns. Information on environmentally sound lawn care practices is available from the Massachusetts Department of Food and Agriculture Pesticide Bureau's at <http://www.massdfa.org>.

2. **Landscaping and Lawn Care** - The Preschool's lawn area is located within the IWPA. Over-application of pesticides and fertilizers on lawns is a potential source of contamination to the water supply.

Recommendation:

- ✓ Use best management practices (BMPs) for applying, handling, and storage of pesticides and fertilizers (refer to attachments on fertilizer and pesticide use).

3. **Septic System** - The school's septic system is located within the IWPA. The leaching field is located approximately 170 feet east of Well #1.

Recommendation:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers and certified operator.
- ✓ Septic system component should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

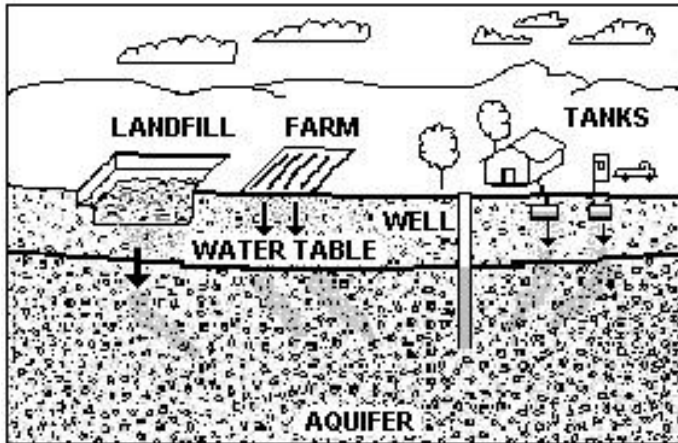


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Children's Place Preschool should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, etc.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in Eastham to include the Children's Place Preschool IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the

"Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- A Homeowner's Guide to Avoiding Costly Heating Oil System Leaks
- Heating Oil Delivery Lines, A Homeowner's Guide to Preventing Leaks



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Easton Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Easton Water Division
<i>PWS Address</i>	417 Bay Road
<i>City/Town</i>	Easton, Massachusetts
<i>PWS ID Number</i>	4088000
<i>Local Contact</i>	John Marsh
<i>Phone Number</i>	(508) 230-0850

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

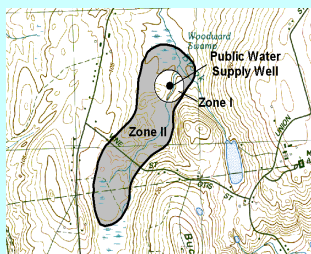
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 287

Susceptibility: High

Well Names	Source IDs
GP Well #1	4088000-01G
GP Well #2	4088000-02G
GP Well #4	4088000-04G

Zone II #: 288

Susceptibility: High

Well Names	Source IDs
GP Well #3	4088000-03G
GP Well #5	4088000-05G

Zone II #: 117

Susceptibility: High

Well Names	Source IDs
GP Well #6	4088000-06G

Easton Water Division draws its water from six wells located in three Zone IIs (reference the above table and attached map to associate water supply sources with corresponding protection areas). All of the wells are located in Easton, however, the Zone IIs for Easton's wells extend into the neighboring communities of Norton, Mansfield, Foxborough, Sharon and Stoughton. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

All of Easton's wells have calcium hydroxide added for corrosion control, and sodium hypochlorite added as a disinfectant. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Easton are a mixture of residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses
3. Transportation corridors

4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone Is for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The six Zone Is for the wells are owned or controlled by Easton. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.
- ✓ Keep any new non water supply activities out of the Zone Is.

2. Residential Land Uses – Residential land use is common throughout the Zone IIs. Areas of Zone II #288 in Mansfield have public sewers and part of Zone II #287 within Stoughton also has public sewers. Septic systems do provide wastewater disposal needs throughout other areas of the Zone IIs. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential

source of microbial contamination.

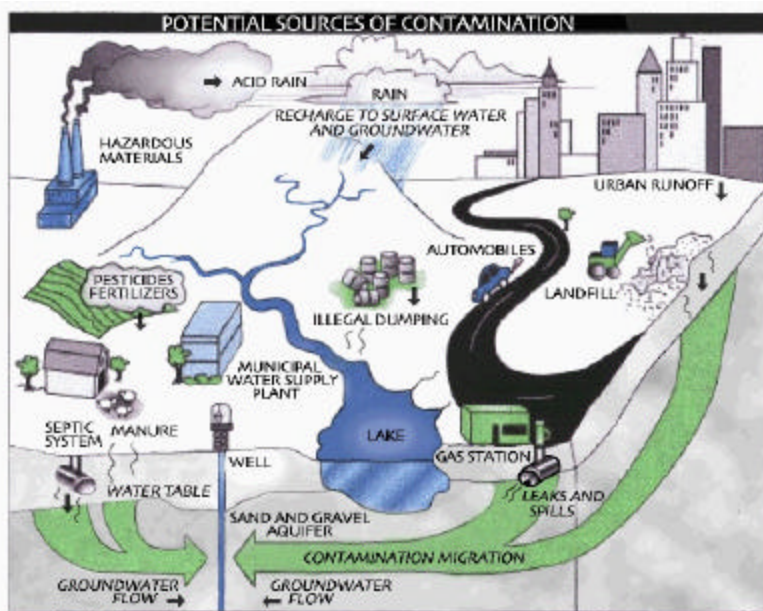
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 106 and Route 123 intersect the Zone IIs. Local roads are common throughout all of the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

A railroad right of way runs through the water supply protection area for GP Wells #1, #2, and #4 and the protection area for GP Wells #3 & #5. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater

outside of the Zone Is.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins of DEP’s Southeast Regional Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

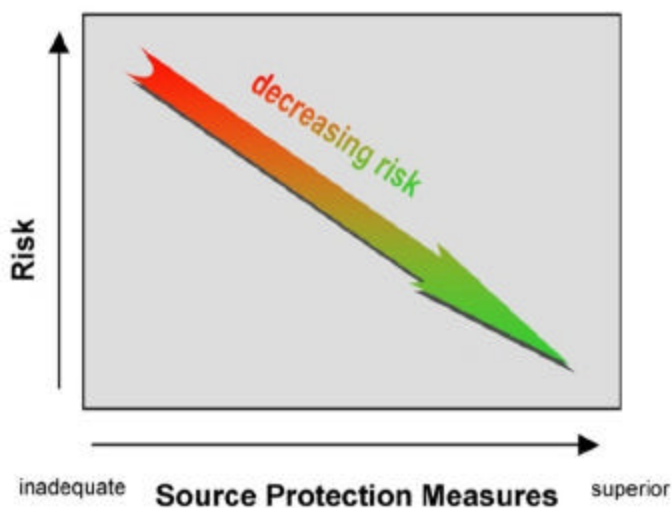


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

*Notes for Table 2 can be found on Page 10

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Livestock Operations	1	M	288	Manure (microbial contaminants): improper handling (Emu Farm)
Landscaping	1	M	288	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Manure Storage or Spreading	1	H	288	Manure (microbial contaminants): improper handling (Emu Farm)
Nurseries	1	M	117	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	117	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Body Shops	3	H	287	Vehicle paints, solvents, and primer products: improper management
Gas Stations	4	H	117 & 287	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	4	H	117 & 287	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	3	M	All	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	1	H	117	Solvents and wastes: spills, leaks, or improper handling
Funeral Homes	1	L	117	Hazardous chemicals: spills, leaks, or improper handling
Railroad Tracks And Yards	2	H	287 & 288	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance
Industrial				
Foundries Or Metal Fabricators	1	M	117	Solvents and other chemicals: spills, leaks, or improper handling or storage (Recently closed)

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	Few	M	All	Materials stored in tanks: spills, leaks, or improper handling
Composting Facilities	1	L	288	Organic material, animal waste, and runoff: storage and improper handling (Emu Farm)
Landfills and Dumps	2	H	287 & 288	Seepage of leachate
Oil or Hazardous Material Sites	4	--	117 & 288	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites
Road And Maintenance	2	M	287 & 288	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or
Schools, Colleges, and Universities	3	M	287 & 288	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or
Stormwater Drains/ Retention Basins	numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way -	1	L	288	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	numerous	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	8	H	All	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	6	L	117 & 287	Hazardous materials and waste: spills, leaks, or improper handling or storage
Waste Transfer/ Recycling Station	1	M	288	Water contacting waste materials: improper management, seepage, and runoff

* Notes for Table 2 can be found on page 10.

4. Hazardous Materials Storage and Use – Although only a small percentage of the land area within the Zone II is zoned for commercial or industrial land use the activities associated with this land use can have significant impacts on water supplies. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000104, 4-0000370 and 4-0015211. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are several agricultural activities within the Zone IIs that include cranberry bogs and livestock operations. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.



7. Protection Planning – Easton has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Use your local Wellhead Protection Team to implement goals of your

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	In the future don't allow any non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring municipalities to protect current and future water supplies within your towns.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update plan as needed. Resources are available at "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Use the committee to achieve the goals of the Wellhead Protection Committee.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Continue extensive outreach and target future efforts at most threatening activities within Zone II.

Wellhead Protection Plan.

- ✓ Compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2) to ensure protection measures are up to date. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Continue to work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, gas stations, landfills and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Easton's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Expanding the area of local bylaw protection beyond the required Zone II boundary to cove the entire Zone III for each source.
- Member of Canoe River Aquifer Advisory Committee.
- Equipping every Water Department vehicle with spill kits.
- Conducting extensive public education and outreach on source protection.
- Making key land purchases to protect the Zone IIs.
- Ensuring that Easton's Phase II Stormwater Planning focuses on water supply protection.
- Using Water Department funds to conduct hazardous waste collection days in Easton.
- Providing a mercury drop off center at the Water Department.
- Applying for and receiving a grant for pesticide education and outreach.
- Promoting the Canoe River Watershed as an Area of Critical Environmental Concern and Sole Source Aquifer.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Monitor activities at emu farm in Mansfield to ensure proper BMPs are being implemented.
- ✓ Ensure reactivation plans for rail lines adequately protect water supplies in Easton.
- ✓ Continue to inspect the Zone Is regularly, and when feasible, remove any non-water supply activities.
- ✓ Work with emergency response teams to ensure that emergency response

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ plans are up to date and consider stormwater drainage in your Zone II.
- ✓ Continue Easton's extensive outreach and public education on source protection issues.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with all farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Notes For Table 2 (Page 5):

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
126840	SUNDELLS CITGO	76 MAIN ST	EASTON	Fuel Dispenser	Fuel Dispenser
132650	ADVANCED CAST PRODUCTS BELCHER DIV	558 FOUNDRY ST	EASTON	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
132650	ADVANCED CAST PRODUC	558 FOUNDRY ST	EASTON	Plant	Air Quality Permit
132650	ADVANCED CAST PRODUCTS BELCHER DIV	558 FOUNDRY ST	EASTON	Generator of Hazardous Waste	Small Quantity Generator
133913	C&J MAPLEWOOD AUTO CENTER INC	490 FOUNDRY ST	EASTON	Fuel Dispenser	Fuel Dispenser
367977	EXXONMOBIL OIL CORP	491 FOUNDRY ST	EASTON	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
367977	MOBIL 11828	491 FOUNDRY ST	EASTON	Fuel Dispenser	Fuel Dispenser
367977	EXXONMOBIL OIL CORP	491 FOUNDRY ST	EASTON	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

Department of Fire Services Registered Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
MOBIL #A3J ID #19180	491 FOUNDRY ST	EASTON	Reinforced	1 Wall	Approved In-Tank Monitor	10000	Gasoline
			Reinforced	1 Wall	Approved In-Tank Monitor	10000	Gasoline
			Reinforced	1 Wall	Approved In-Tank Monitor	10000	Gasoline
			Reinforced	1 Wall	Approved In-Tank Monitor	10000	Gasoline
VERIZON MASSACHUSETTS #513407 ID #3070	64 N MAIN ST	EASTON	Steel	2 Walls	Interstitial Monitoring	1000	Diesel
DPW HIGHWAY GARAGE ID #3330	500 EAST ST	MANSFIELD	Reinforced	2 Walls	Interstitial Monitoring	6000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	6000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	2500	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Notes: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000104	240 BRANCH ST	MANSFIELD	Oil
4-0000370	491 FOUNDRY ST	EASTON	Oil
4-0015211	50 EAST ST	MANSFIELD	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Edgartown Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Edgartown Water Department
<i>PWS Address</i>	24 Machacket Road
<i>City/Town</i>	Edgartown, Massachusetts 02539
<i>PWS ID Number</i>	4089000
<i>Local Contact</i>	Fred Domont
<i>Phone Number</i>	(508) 627-4717

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

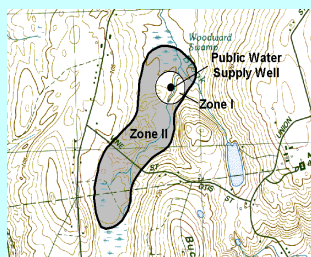
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 233

Susceptibility: High

Well Names	Source IDs
Machacket Well	4089000-04G
Lily Pond Well	4089000-05G

Zone II #: 428

Susceptibility: High

Well Names	Source IDs
Wintucket Well	4089000-06G
Quenomica Well	4089000-07G

The Edgartown Water Department receives its water from four groundwater wells located in two Zone II recharge areas, see tables above. All of the groundwater on the Island of Martha's Vineyard comes from a sole source aquifer. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All four wells have sodium hydroxide and zinc orthophosphate added for corrosion control, and chlorine added as a disinfectant when necessary. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Edgartown are dominated by forest, open land and residential land uses with small areas of commercial, and light industrial land uses in the Zone II for the Machacket Well and Lily Pond Well (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I

through a conservation restriction. The four Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential areas are common throughout both Zone IIs. Only about 1% of the Zone II areas have public sewers, and so most use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or

accidents.

Residential Land Use Recommendations:

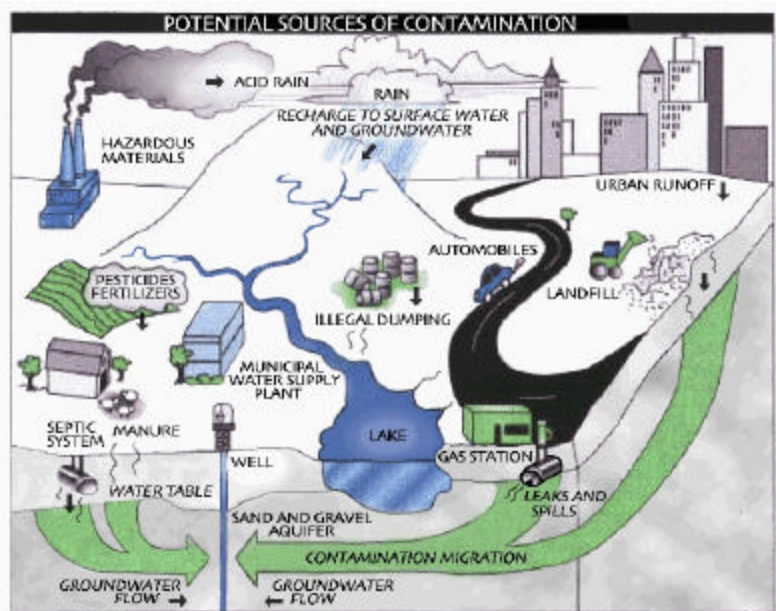
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



3. Transportation Corridors - Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Ensure that drains discharge stormwater outside of the Zone Is.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone IIs can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone IIs. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use— Small areas of the Zone II for the Machacket Well and Lily Pond Well are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins of DEP's Southeast Regional Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

5. Agricultural Activities – Very limited farming

(Continued on page 6)

Source Protection Decreases Risk

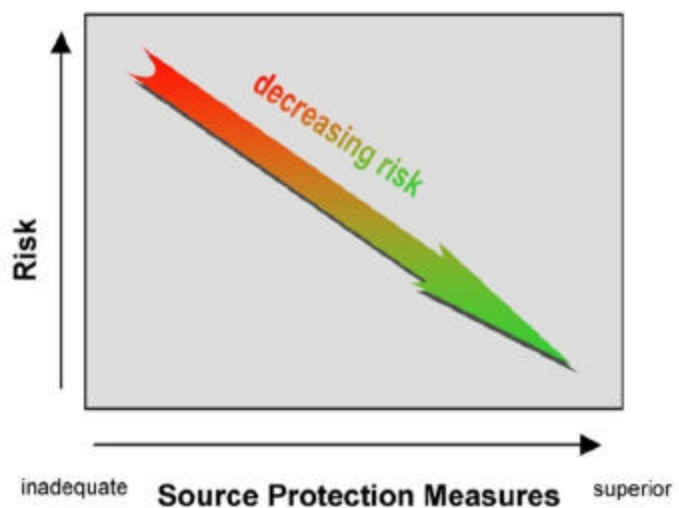


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Manure Storage or Spreading	1	H	233	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use	1	M	233	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	233	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Service Stations/ Auto Repair Shops	1	H	428	Automotive fluids and solvents: spills, leaks, or improper handling
Boat Yards/Builders	1	H	233	Fuels, paints, and solvents: spills, leaks, or improper handling
Golf Courses	1	M	428	Fertilizers or pesticides: over-application or improper handling
Residential				
Fuel Oil Storage (at residences)	numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	some	M	Both	Materials stored in tanks: spills, leaks, or improper handling (includes storage of water treatment chemicals at wellsites)
Landfills and Dumps	1	H	233	Seepage of leachate
Land Application Of Sewage Sludge	1	M	233	Sludge and runoff (metals): improper management
Stormwater Drains/ Retention Basins	numerous	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Wastewater Treatment Plant/ Collection Facility/ Lagoon	1	M	233	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management

* Notes for Table 2 can be found on page 6.

Notes for Table 2:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

and livestock uses exist in the Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, Edgartown does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells. Edgartown does not have a Wellhead Protection Committee to assist in the implementation of the recommendations of its Wellhead Protection Plan.

Protection Planning Recommendations:

- ✓ Establish a Wellhead Protection Committee to implement the long term recommendations of your Wellhead Protection Plan. Include representatives from citizens groups, businesses, town officials and the water supplier.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). For more information on DEP land use controls see <http://mass.gov/dep/>

[brp/dws/protect.htm](http://dws/protect.htm).

- ✓ Assist the Board of Health with targeting and performing floordrain inspections within the Zone IIs.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, a landfill, and a wastewater treatment plant. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership or control of all the Zone Is.
- Implementation of local bylaws and floordrain regulations that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2).
- Encouraging the Town to protect open space in the Zone IIs as conservation land.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections.
- ✓ Educate residents and businesses on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water

supplies.



Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. EPA also lists possible funding sources for water quality at <http://www.nalusda.gov/wqic/funding.html>

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local

(Continued on page 9)

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Ensure non-water supply activities are not allowed in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Edgartown has bylaws that meet DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	N/A	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Team to implement protection recommendations of your plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, state forest, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	NO	Aim efforts at residents, commercial, industrial and municipal uses within the Zone IIs.

(Continued from page 7)

drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 1

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
39253	EDGARTOWN LANDFILL	MESHACKET RE	EDGARTOWN	Sanitary Landfill	Landfill
54372	MSPCA EDGARTOWN	VINEYARD HAVEN RD.	EDGARTOWN	Plant	Air Quality Permit
327285	VINYARD GOLF CLUB	100 CLUBHOUSE DR	EDGARTOWN	Very Small Generator of Hazardous Waste	Very Small Generator of Waste Oil or PCBs
378138	HERRING CREEK MARINE INC.	12 HERRING CREEK RD.	EDGARTOWN	Very Small Generator of Hazardous Waste	Very Small Generator of Waste Oil or PCBs

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No DFS registered Underground Storage Tanks were identified during the assessment.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
No DEP Tier Classified Sites were identified during the assessment.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Fairhaven Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Fairhaven Water Department
<i>PWS Address</i>	5 Arsene Street
<i>City/Town</i>	Fairhaven, Massachusetts 02719
<i>PWS ID Number</i>	4094000
<i>Local Contact</i>	Edward Fortin, Superintendent
<i>Phone Number</i>	4094000

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

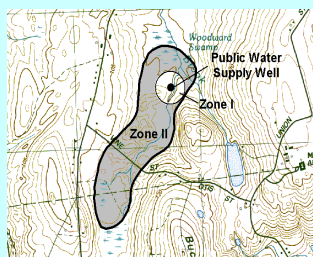
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

IWPA

Susceptibility: High

Well Names	Source IDs
Nasketucket Well (inactive wellfield)	4094000-01G

Zone II #: 480

Susceptibility: High

Well Names	Source IDs
Mattapoisett Well (inactive wellfield)	4094000-02G

Zone II #: 441

Susceptibility: High

Well Names	Source IDs
Wolf Island Road Well #1	4094000-03G
Wolf Island Road Well #2	4094000-04G
Wolf Island Road Well #3	4094000-05G

Zone II #: 28

Susceptibility: High

Well Names	Source IDs
Tinkham Lane Well	4094000-06G

The Fairhaven Water Department consists of four active wells located in the town of Mattapoisett that supply drinking water to its customers in Fairhaven. The Water Department also has two inactive tubular wellfields, one located in Fairhaven and the other in Mattapoisett. All six active and inactive sources will be assessed as part of this report. The wells and wellfields are located in three Zone II recharge areas and one Interim Wellhead Protection Area (IWPA), use above table for reference. The Zone II recharge areas primarily lay within the towns of Mattapoisett and Rochester with small portions in Acushnet. Each well has a Zone I of 400 feet and each wellfield has a Zone I extending 250 feet out from the edge of the wellfield. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. The Nasketucket wellfield is also susceptible to salt water intrusion during certain weather events or tides. Please refer to the attached maps to view the boundaries of the Zone Is and Zone II.

The Wolf Island Wells #1, #2 and #3 receive treatment to control levels of iron and manganese through a sequestration process that involves addition of metaphosphate to the water. All of the water for Fairhaven is treated for corrosion control through the addition of potassium hydroxide which raises the pH of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs and IWPA for Fairhaven are dominated by a mixture of forest and residential land uses with smaller areas of agricultural, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning
7. Oil or hazardous material contamination sites

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead or 250 feet from the edge of the wellfields. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone Is for the four active wells are owned or controlled by the public water system, the Zone Is for the inactive wellfields are not completely controlled by the public water supplier at this time. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Nasketucket Well 4094000-01G (inactive)– The Zone I contains residences and athletic fields.

Zone I: Mattapoissett Well 4094000-02G (inactive) – The Zone I contains local roads, cows and about ten residences with septic.

Zone I: Wolf Island Wells #1 and #2 4094000-03G & 04G – Zone Is contain local roads.

Zone I Recommendations:

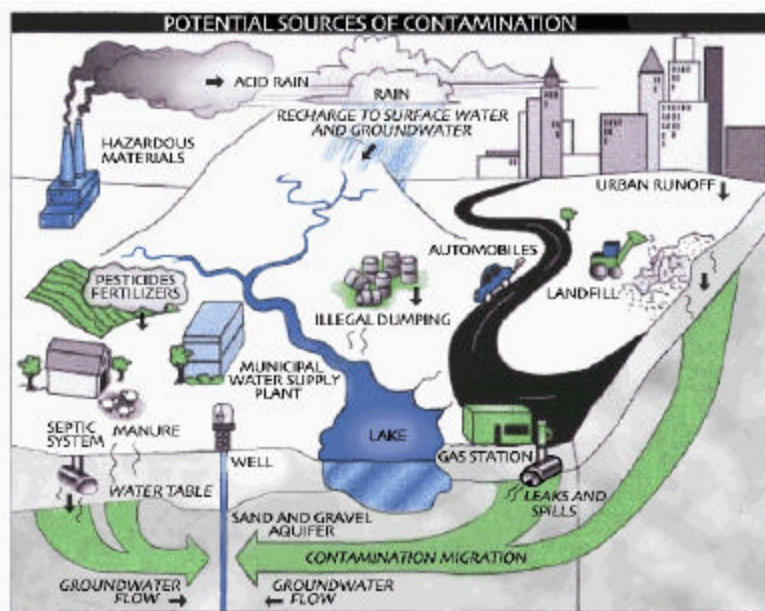
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

2. Residential Land Uses – Residential land use is common throughout all the Zone IIs and IWPA. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit

DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 195 runs through the Zone II for the Mattapoisett Well and Route 240 runs through the IWPA for the Nasketucket Well. Local roads are common throughout all the Zone IIs and IWPA. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

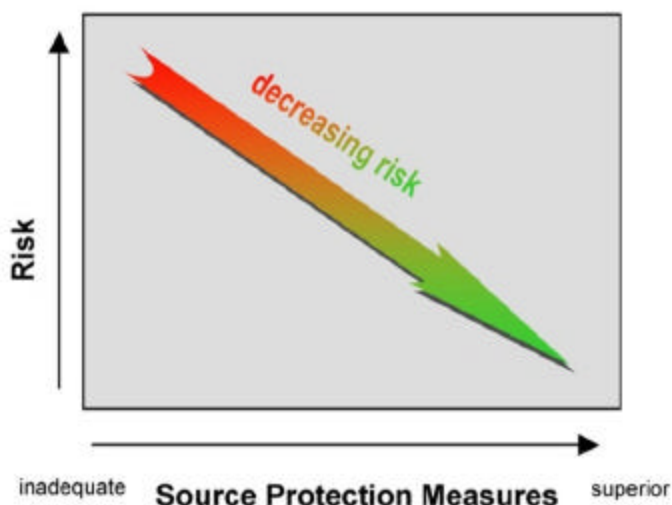


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II or IWPA	Potential Source of Contamination
Agricultural				
Dairy Farms	few	M	Zone IIs	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use	some	M	Zone IIs and IWPA	Fertilizers: leaks, spills, improper handling, or over-application (cranberry bogs)
Pesticide Storage or Use	some	H	Zone IIs and IWPA	Pesticides: leaks, spills, improper handling, or over-application (cranberry bogs)
Commercial				
Cemeteries	2	M	Zone IIs 441 & 480	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Sand And Gravel Mining/Washing	1	M	Zone IIs	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Residential				
Fuel Oil Storage (at residences)	numerous	M	Zone IIs and IWPA	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	Zone IIs and IWPA	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	Zone IIs and IWPA	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	few	M	Zone IIs and IWPA	Materials stored in tanks: spills, leaks, or improper handling (includes storage of water treatment chemicals at wellsites)
Aquatic Wildlife	some	L	Zone IIs and IWPA	Microbial contaminants

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Miscellaneous Continued				
Fishing/Boating	some	L	Zone IIs and IWPA	Fuel and other chemical spills, microbial contaminants
Oil or Hazardous Material Sites	2	--	IWPA	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are
Schools, Colleges, and Universities	1	M	Zone II #480	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way -	3	L	Zone IIs	Corridor maintenance pesticides: over-application or improper handling; construction (Gas line and electrical line easements)
Underground Storage Tanks	6	H	Zone II #441 & #480 and IWPA	Stored materials: spills, leaks, or improper handling
Transportation Corridors	2	M	Zone II #480 and IWPA	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Small areas of the Zone IIs and IWPA are zoned for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly

stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Agricultural Activities – There are several cranberry bogs within the Zone IIs and some small livestock operations. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Protection Planning – Currently, the Fairhaven Water Department has met “Best Effort” requirements, which means the Fairhaven Water Department has

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



encouraged Mattapoisett and Rochester to enact water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Mattapoisett does have protection controls for three of their sources however, these controls do not cover all of Fairhaven’s Zone II areas. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Use your protection team to implement goals of plan. Refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Continue “Best Effort” communications with Mattapoisett officials and compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, encourage Mattapoisett to adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES/NO	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. (Zone Is for Inactive Wells aren't completely controlled by water supplier)
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Fairhaven has met DEP's "Best Effort" requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES/NO	Continue to encourage Mattapoisett and Rochester to include all of your Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a comprehensive wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Consider expanding committee to include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

7. Presence of Oil or Hazardous Material Contamination Sites – The IWPA for the Nasketucket Well (inactive) contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000492 and 4-0011287. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

Other land uses and activities within the Zone II include sand and gravel mining and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership and control of the Zone I areas for the Water Department's active Wells.
- Meeting DEP's "Best Effort" requirements for encouraging Mattapoisett and Rochester to protect the Fairhaven Zone IIs.
- Participating on and maintaining close relationship with the Mattapoisett River Aquifer Advisory Committee and Mattapoisett Aquifer Advisory Committee.
- Along with the town of Mattapoisett, Fairhaven assesses themselves a fee where the funds are directed towards water supply protection purposes.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Educate residents, businesses and farmers on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a comprehensive Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA**DEP Permitted Facilities**

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
No DEP Bureau of Waste Prevention Major Facilities identified at this time.					

Table of Underground Storage Tanks located on next page.

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
AT&T ID #3146	200 MILL RD	FAIRHAVEN	Reinforced	2 Walls	Interstitial Monitoring	20000	Fuel Oil
			Reinforced	2 Walls	Interstitial Monitoring	25000	Kerosene
			Reinforced	2 Walls	Interstitial Monitoring	25000	Kerosene
			Reinforced	2 Walls	Interstitial Monitoring	25000	Kerosene
			Reinforced	2 Walls	Interstitial Monitoring	25000	Kerosene
G BOURNE KNOWLES CO INC ID #3118	267 HUTTLESTON AVE	FAIRHAVEN	Steel	1 Wall	Inventory Record-Keeping	1100	Diesel
TITLEIST AND FOOTJOY WORLDWIDE ID #1194	333 BRIDGE ST	FAIRHAVEN	*	*	*	12000	*
			*	*	*	20000	*
TOWN OF FAIRHAVEN DPW ID #3128	5 ARSENE ST	FAIRHAVEN	Cathodic	2 Walls	Interstitial Monitoring	12000	*
			Cathodic	2 Walls	Interstitial Monitoring	10000	*
MATTAPOISETT FUEL SERVICE & FOOD ID #15519	62 FAIRHAVEN RD	MATTAPOISETT	Steel	1 Wall	Inventory Record-Keeping	1000 (Above Ground)	Diesel
			Steel	1 Wall	Inventory Record-Keeping	1000 (Above Ground)	Diesel
			Composite	2 Walls	Interstitial Monitoring	12000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	8000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	6000	Diesel
VERIZON MASSACHUSETTS #535407 ID #892	118 NORTH AVE	ROCHESTER	Reinforced	2 Walls	Interstitial Monitoring	1000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* No further information available.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0011287	276 HUTTLESTON AVE	FAIRHAVEN	Oil
4-0014120	200 MILL ROAD ANX	FAIRHAVEN	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Otis Air National Guard Base

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Otis Air National Guard Base
<i>PWS Address</i>	197 Granville Ave., Bldg. 868
<i>City/Town</i>	Falmouth
<i>PWS ID Number</i>	4096001
<i>Local Contact</i>	Christopher M. Faux, Lt. Col., MAANG, BSC
<i>Phone Number</i>	(508) 968-4844

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

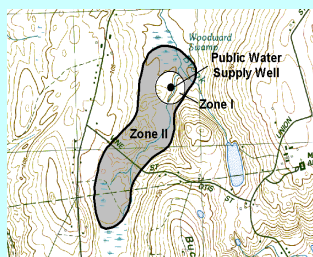
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 611

Susceptibility: High

Well Names	Source IDs
Gravel Packed Well J	4096001-01G

Otis Air National Guard Base receives its water from one groundwater source. Gravel Packed Well J is located north of the landing strips and northeast of Herbert Road. The well has a Zone I radius of 400 feet. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Potassium carbonate is added to the well water for corrosion control, sodium carbonate is added for hardness removal, sodium fluoride is added for fluoridation, sodium hypochlorite is added for disinfection, and granular activated carbon is used to filter out volatile organic carbon contaminants. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The land uses for the Zone II for Otis Air National Guard Base are predominantly residential and crop land. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Oil or hazardous material contamination sites
4. Agricultural activities
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A..

1. Inappropriate Activities in Zone I – The Zone I for Gravel Packed Well J is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I Activities: Herbert Road runs through the Zone I. Roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Gate the access road to the well and gate or block off any trails in the Zone I that could be used by motor vehicles.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Wherever possible, ensure that Herbert Road drains discharge stormwater outside of the Zone I.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone I and Zone II can be effectively contained. Review storm drainage maps with emergency response teams.

2. Residential Land Uses – Most of the residential areas within the Zone II do not have public sewers, and therefore use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

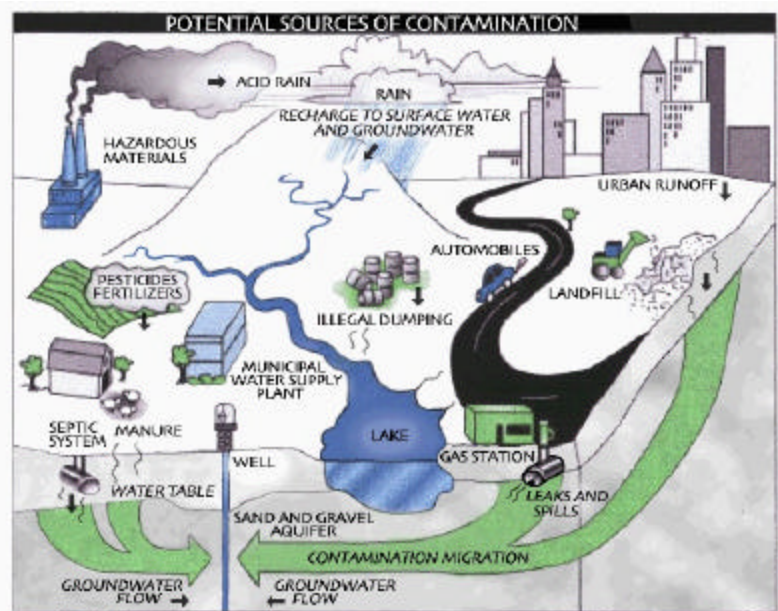
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm,

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- ✓ which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Oil or Hazardous Material Contamination Sites – The Zone II for Gravel Packed Well J contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40015031. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or hazardous material contamination site.

4. Agricultural Activities – There are crop land operations occurring in the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

5. Protection Planning – Currently, the Town of Sandwich has water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). The Town of Sandwich has also established a floor drain regulation. However, the Zone II for Otis Air National Guard Base's Gravel Packed Well J is not currently included in Sandwich's Water Resource Districts. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

Protection Planning Recommendations:

- ✓ Work with the Town of Sandwich to incorporate the Zone II into the Water Resource Districts.
- ✓ Work with town boards and Otis Air National Guard Base facility planners to review and provide recommendations on proposed

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

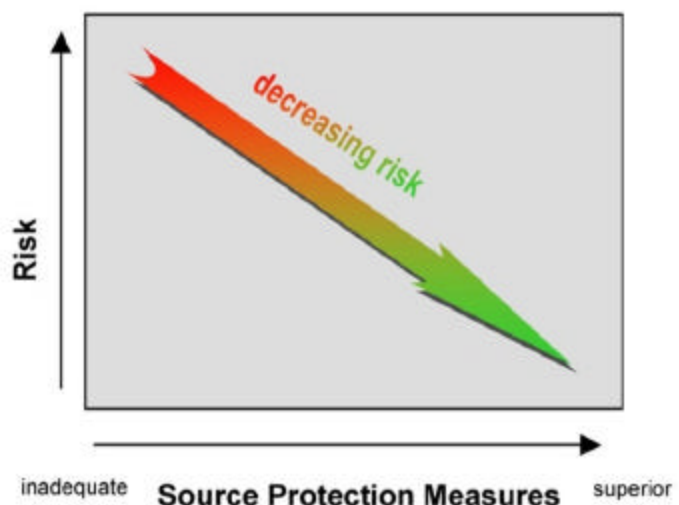


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or	some	Moderate	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	some	High	Pesticides: leaks, spills, improper handling, or over-application (cropland)
Residential			
Fuel Oil Storage (at residences)	numerous	Moderate	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Military Facilities	1	High	Pesticides and herbicides, fuel, chemicals and other materials: spills, leaks, or improper handling or storage; may include ordnance or waste landfill/dump sites
Oil or Hazardous Material Sites	1	-	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Gravel Packed Well J's Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Posting the Zone I area with signs;
- Having a Wellhead Protection Plan;
- Having a formal Emergency Response Plan; and,
- Providing wellhead protection education to residents.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Work with the Town of Sandwich to incorporate the Zone II into the Water Resource Districts.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Monitor progress on any future remedial action conducted for oil or hazardous waste contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3 and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue routine inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Restrict motor vehicle access to trails within the Zone I. Restrict the use of road salt on the sections of Herbert Road that are within the Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Work with the Town of Sandwich to have the Zone II included in the Town's "Water Resource Districts" .
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and Otis Air National Guard Base, local , and state emergency response officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at agricultural uses within the Zone II.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

DEP Permitted Facilities:

There are no known DEP Permitted Facilities located within the Zone II.

State Fire Marshall's Listing of Underground Storage Tanks:

No Underground Storage Tanks listed on the State Fire Marshall's database for the Town of Sandwich appear to be located within the Zone II.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0015031	Forestdale-Pocasset Road	Bourne	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Foxborough Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Foxborough Water Department
<i>PWS Address</i>	40 South Street
<i>City/Town</i>	Foxborough
<i>PWS ID Number</i>	4099000
<i>Local Contact</i>	Leo Potter
<i>Phone Number</i>	(508) 543-1209

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

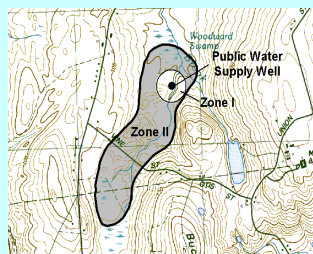
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 79

Susceptibility: Moderate

Well Names	Source IDs
Pumping Station #1	4099000-01G
Pumping Station #1	4099000-02G
Pumping Station #1	4099000-03G
Pumping Station #5	4099000-13G

Zone II #: 80

Susceptibility: High

Well Names	Source IDs
Pumping Station #3	4099000-07G
Pumping Station #3	4099000-08G
Pumping Station #3	4099000-09G
Pumping Station #3	4099000-10G

Zone II #: 366

Susceptibility: High

Well Names	Source IDs
Pumping Station #2	4099000-04G
Pumping Station #2	4099000-05G
Pumping Station #2	4099000-06G

Zone II #: 367

Susceptibility: High

Well Names	Source IDs
Pumping Station #2	4099000-12G

The Town of Foxborough is supplied by groundwater pumped from 11 gravel packed wells that are located in four separate Zone IIs (reference table above to correspond wells with Zone IIs). Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone IIs.

All of Foxborough's water is treated with sodium hexametaphosphate for iron and manganese removal and as a corrosion inhibitor, potassium hydroxide to raise the water's pH making it less corrosive and sodium hypochlorite is added as a disinfectant. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Foxborough are dominated by a mixture of forest and residential land uses with small areas of commercial and light industrial land uses (refer to attached maps for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone Is for the wells are all owned or controlled by the public water system. Only water supply activities are allowed in the Zone I.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Continue keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 35% of the Zone IIs consist of

residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

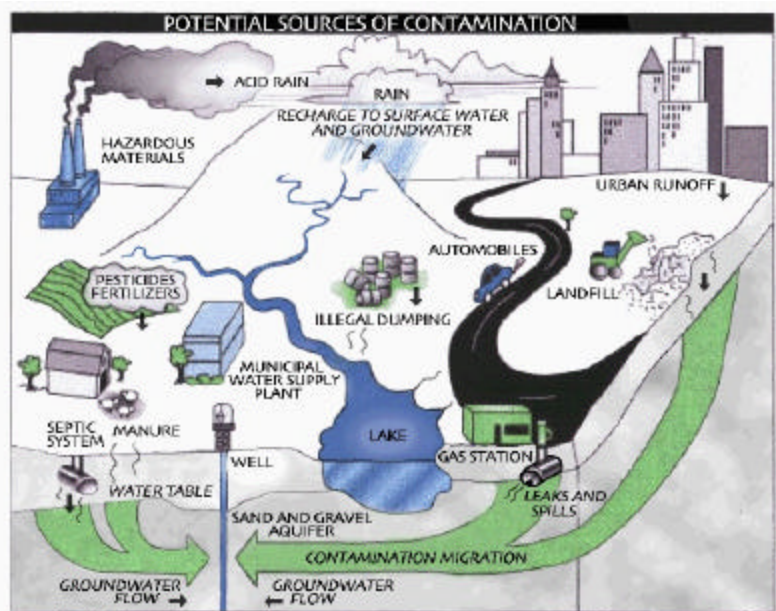
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 95 runs through the Zone II for Pumping Station #3 and Routes 1 and 140 run through the Zone II for Pumping Station #4. Local roads are common throughout all of the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone Is.

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – The Zone IIs contain commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 849-4030 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

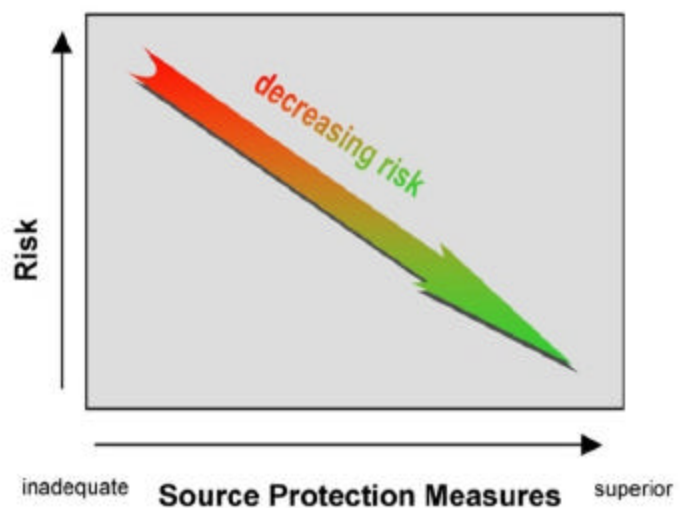


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	80	Fertilizers: leaks, spills, improper handling, or over-application (Sharon, berry farm and corn)
Landscaping	1	M	366	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	2	M	366	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	80	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Car/Truck/Bus Washes	1	L	367	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	1	H	80	Automotive fluids and fuels: spills, leaks, or improper handling or storage (Sharon)
Service Stations/ Auto Repair Shops	2	H	367	Automotive fluids and solvents: spills, leaks, or improper handling
Dry Cleaners	1	H	80	Solvents and wastes: spills, leaks, or improper handling (Sharon)
Furniture Stripping and Refinishing	1	H	366	Hazardous chemicals: spills, leaks, or improper handling
Golf Courses	1	M	366	Fertilizers or pesticides: over-application or improper handling
Junk Yards and Salvage Yards	1	H	80	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Medical Facilities	1	M	367	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All Zone IIs	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All Zone IIs	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All Zone IIs	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Fishing/Boating	1	L	79	Fuel and other chemical spills, microbial contaminants
Oil or Hazardous Material Sites	4	--	79, 80, & 367	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Stormwater Drains/ Retention Basins	numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns. (Stormwater runoff from stadium parking is a major concern within Zone II# 367)
Transmission Line Rights-of-Way - Type: Power Line	1	L	80	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	numerous	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone IIs contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000202, 4-0011387, 4-0011642 and 4-0014036. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – A portion of the Zone II for Pump Station #3 within the Town of Sharon contains farming. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Coordinate with the town of Sharon to work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



7. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). A portion of the Zone II for Foxborough’s Pumping Station #3 runs into Sharon. Sharon shares water withdrawals from this aquifer and Sharon also meets DEP’s Wellhead Protection regulations 310 CMR 22.21(2).

In the Spring of 2000, Foxborough authorized the establishment of a Citizen’s Advisory Committee (CAC) to investigate, evaluate and report on the existing environmental conditions and determine the present and future alternatives to address both water resource needs and wastewater collection options as part of a Comprehensive Wastewater Management Plan (CWMP). Currently the CAC is overseeing the Phase II of the CWMP.

In addition, Foxborough belongs to the Canoe River Aquifer Advisory Committee (CRAAC). CRAAC is a regional committee that consists of the towns of Easton, Mansfield, Norton, Foxborough and Sharon. All five towns have been working together for the past 16 years to protect the Canoe River Aquifer. One of CRAAC’s current goals is to develop consistent zoning bylaws and local regulations within the Canoe River watershed. Foxborough’s regulations were chosen because the town has various zoning and non-zoning regulations besides its Water Resource Protection District by-law that protects its water supplies.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	NO	Economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Keep bylaws and local regulations up to date, refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with Sharon to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement objectives of your Wellhead Protection Plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Foxborough has a Wellhead Protection Plan in place.

Protection Planning Recommendations:

- ✓ Coordinate efforts with local officials to keep local wellhead protection controls current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Use CWMP CAC to implement recommendations of Foxborough's Wellhead Protection Plan.
- ✓ Ensure that the local Board of Health prioritizes floordrain inspections within the Zone II areas of Foxborough.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities of concern within the Zone IIs include auto service stations, a gas station, a dry cleaner and a junk yard. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier and town is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Establishing a Citizens Advisory Committee to study Foxborough's water and wastewater current and future needs.
- Participating in the Canoe River Aquifer Advisory Committee (CRAAC) and for providing model local zoning and non-zoning regulations for other CRAAC member towns to emulate.
- Holding annual household hazardous waste day for the last 16 years and including informational materials on water supply protection to participants.
- Providing a weekly waste oil and paint collection center.
- Receiving a source protection award for its dedication in developing a Water Reuse Plan for the protection of drinking water supplies. In 1999, the approval of the Patriot Stadium and Economic Development Area presented the Town with the challenge of providing an additional 24 million gallons of water annually. To facilitate the development of the Water Reuse Plan (the first in Massachusetts), the Foxboro water department successfully established a cooperative agreement with the Patriots, conducted numerous public informational meetings, and fostered the necessary support and

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- understanding for the plan's approval.
- Receiving a source protection award for developing a unique groundwater monitoring program for 13 wells based on a comprehensive database of potential contaminant sources and area hydrogeology.
- Their other notable programs include frequently requiring environmental impact statements for developments within their protection district and a substantial budget for evaluation of MEPA projects and 21E sites.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue the Zone I inspections regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone IIs and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- Regulated Facilities within the Water Supply Protection Area
- Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
131467	HARWOOD ASSOC INC	95 WASHINGTON ST	FOXBOROUGH	HANDLR	VSQG	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
375019	XTRA LEASE INC.	95 WASHINGTON ST	FOXBOROUGH	HANDLR	VSQG	VERY SMALL QUANTITY GENERATOR OF WASTE OIL OR PBBs
135758	CUMBERLAND FARMS #2453	433 SOUTH ST	SHARON	FULDSP	FULDSP	FUEL DISPENSER
293861	CORMANS CLEANERS	380 SOUTH MAIN ST	SHARON	HANDLR	VSQG	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Cumberland Farms Inc.	433 South Main Street	Sharon	Reinforced	2 Walls	I	8000	Gasoline
			Reinforced	2 Walls	I	8000	Gasoline
			Reinforced	2 Walls	I	8000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0011387	NEPONSET RESERVOIR	FOXBOROUGH	Hazardous Material
4-0014036	RTE 95 NORTH	FOXBOROUGH	Hazardous Material
4-0000202	170-186 OAK ST	FOXBOROUGH	Oil and Hazardous Material
4-0011642	RTE 140	FOXBOROUGH	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Franklin Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Franklin Water Division
<i>PWS Address</i>	Municipal Building, 150 Emmons Street
<i>City/Town</i>	Franklin, Massachusetts 02038
<i>PWS ID Number</i>	4101000
<i>Local Contact</i>	Anthony Mucciarone
<i>Phone Number</i>	(508) 520-4915

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

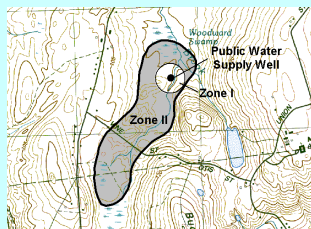
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Section 1: Description of the Water System

<i>Zone II:</i>	<i>Well Names</i>	<i>Source IDs</i>	<i>Susceptibility:</i>
#249	Well #1	4101000-01G	High
#249	Well #2	4101000-02G	High
#216	Well #3	4101000-03G	High
#174	Well #4	4101000-04G	High
#174	Well #5	4101000-05G	High
#216	Well #6	4101000-06G	High
#248	Well #7	4101000-07G	High
IWPA	Well #8	4101000-08G	Moderate
#57	Well #9	4101000-09G	High
#56	Well #10	4101000-10G	Moderate

The Town of Franklin receives its drinking water from ten groundwater wells located in six Zone II recharge areas and one Interim Wellhead Protection Area (IWPA). Each well has a Zone I of 400 feet except for Well #6 which is a wellfield and has a Zone I extending 250 feet from the edge of the wellfield. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is, Zone II and IWPA.

All of Franklin's water is treated with potassium hydroxide for corrosion control, fluoride for dental health, metaphosphate for iron control, and sodium hypochlorite for disinfection. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Franklin are predominantly a mixture of forest and residential land uses with smaller areas of commercial and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead except for Well #6 which is a wellfield and has a Zone I extending 250 feet from the edge of the wellfield. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone Is for the wells are owned or controlled by the public water system except for Wells #1, #2 and #3. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Well #1 and Well #2 (4101000-01G & 4101000-02G) – Route 495 runs through the Zone Is for these wells.

Zone I: Well #3 (4101000-03G) – Grove Street runs through the Zone I.

Zone I Recommendations:

- ✓ Map stormwater drainage within Zone Is.
- ✓ Direct stormwater drainage out of Zone Is.
- ✓ Highlight Zone I areas in emergency response planning for Town and state emergency responders.
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land use is common throughout all of the Zone Is and IWPA for Franklin. Approximately 65-70% of the areas have public sewers, and so about 30% use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water

Benefits of Source Protection

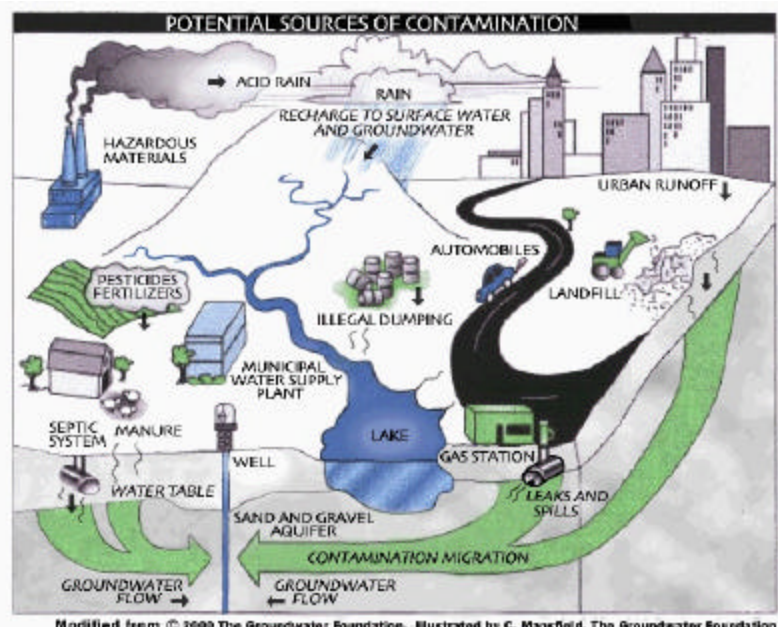
Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of



contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 495 runs through the Zone IIs for Wells #1, #2 and #7. Route 140 runs through the Zone IIs of Wells #4, #5 and #9. Local roads are common throughout all the Zone IIs and IWPA. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run directly through the Zone II for Wells #1 & #2, the Zone II for Wells #3 & #6 and the Zone II for Wells #4 & #5. Rail corridors serving

passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

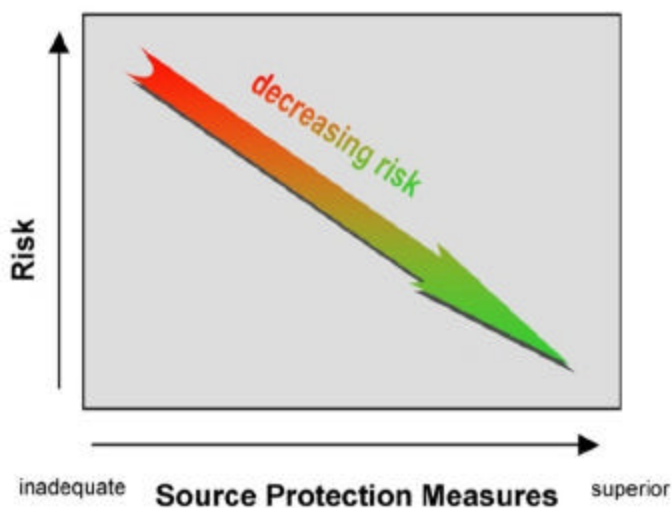


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II or IWPA	Potential Source of Contamination
Commercial				
Body Shops	1	H	#57	Vehicle paints, solvents, and primer products: improper management
Gas Stations	5	H	#57 & #174	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Furniture Stripping and Refinishing	1	H	#248	Hazardous chemicals: spills, leaks, or improper handling (On sanitary sewer)
Paint Shops	1	H	#248	Paints, solvents, other chemicals: spills, leaks, or improper handling or storage (On sanitary sewer)
Railroad Tracks And Yards	1	H	#174, #216, & #249	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals:
Industrial				
Foundries Or Metal Fabricators	1	H	#249	Solvents and other chemicals: spills, leaks, or improper handling or storage
Fuel Oil Distributors	1	H	#249	Fuel oil: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	H	#249	Solvents and metal tailings: spills, leaks, or improper handling
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Miscellaneous				
Aquatic Wildlife	some	L	All	Microbial contaminants
Composting Facilities	1	L	#249	Organic material, animal waste, and runoff: storage and improper handling
Landfills and Dumps	1	H	#249	Seepage of leachate
Large Quantity Hazardous Waste	1	H	#174	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	1	--	#174	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Small quantity hazardous waste generators	1	M	#216	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	1	M	#248 & 249	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Very Small Quantity Hazardous Waste Generator	3	L	#249	Hazardous materials and waste: spills, leaks, or improper handling or storage
Waste Transfer/ Recycling Station	1	M	#249	Water contacting waste materials: improper management, seepage, and runoff
Transmission Line Rights-of-Way - Type: Electric	1	L	IWPA, #248 & #249	Corridor maintenance pesticides: over-application or improper handling; construction

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Numerous areas within the Zone IIs are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II for Wells #4 & #5 contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 4-0015426. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known

oil or contamination sites.



6. Protection Planning – Currently, the Franklin does not have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Expand the Land Acquisition Committee into a protection team and use the committee to implement the goals outlined in your Wellhead Protection Plan. Wellhead Protection Committee should include members from the Town, citizen’s groups and business groups. Refer them to <http://mass.gov/dep/brp/dws/protect.htm> for more guidance.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). Assist local officials with adoption of controls that meet 310 CMR 22.21 (2). For more information on DEP land use controls see <http://mass.gov/>

(Continued on page 9)

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES/NO	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. Consider Wells #1 & #2 for relocation.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring activities on Rt. 495 in Zone Is for Wells #1 & #2. Ensure emergency responders are aware of well locations.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Coordinate efforts with Catherine Sarafinas at DEP, phone # (617) 556-1070 . Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement goals of Wellhead Protection Plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES/NO	Franklin has a Land Acquisition Committee. Expand committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	The Water Division coordinates with the Board of Health, Building Department and Fire Department. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

dep/brp/dws/protect.htm.

- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, gas stations, and furniture refinishing. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Franklin continues to protect open space vital to water supply protection through their active land acquisition program.
- Franklin maintains very tight security at its wells.
- Franklin plans on instituting a program to control and track residential underground storage tanks.
- Franklin has an aggressive Aquifer Protection Bylaw.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Submit required information to DEP to receive approval outlined in DEP's Wellhead Protection regulations 310 CMR 22.21(2).
- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.
- ✓ Expand Wellhead Protection Committee and implement Wellhead Protection Plan.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

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DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
130852	FRANKLIN PAINT CO	259 COTTAGE ST	FRANKLIN	Sewer Connection or Groundwater Discharge	Below Industrial Waste Water Regulated Levels
130852	FRANKLIN PAINT CO	259 COTTAGE ST	FRANKLIN	Plant	Air Quality Permit
130852	FRANKLIN PAINT CO INC	259 COTTAGE ST	FRANKLIN	Toxics Use Reduction Filer	Large Quantity Toxics User
130852	FRANKLIN PAINT CO INC	259 COTTAGE ST	FRANKLIN	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
132679	J & J CORRUGATED BOX CORPORATION	210 GROVE ST	FRANKLIN	Toxics Use Reduction Filer	Large Quantity Toxics User
132679	J&J CORRUGATED BOX CORP	210 GROVE ST	FRANKLIN	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
132679	J&J CORRUGATED BOX C	210 GROVE ST	FRANKLIN	Plant	RES APPLICATION APPROVED
132679	J & J CORRUGATED BOX CORPORATION	210 GROVE ST	FRANKLIN	Toxics Use Reduction Filer	Large Quantity Toxics User
132679	J&J CORR BOX CORP	210 GROVE ST	FRANKLIN	Sewer Connection or Groundwater Discharge	Industrial Waste Water to Sewer
132679	J & J CORRUGATED BOX COMPANY	P O BOX 355	FRANKLIN	Ground Water Facility (BRP)	Groundwater Discharge
133977	CHELSEA DRUM COMPANY	300 BEAVER ST	FRANKLIN	Plant	Air Quality Permit
133977	CHELSEA DRUM CO INC	300 BEAVER ST	FRANKLIN	Sewer Connection or Groundwater Discharge	Industrial Waste Water to Sewer
133977	CHELSEA DRUM CO INC	300 BEAVER ST	FRANKLIN	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
224338	TRAFFIC MARKINGS INC	1 MASTER DR	FRANKLIN	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
319161	CLASSIC FURNITURE SERVICES	90 HAYWARD ST	FRANKLIN	Plant	Air Quality Permit

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
319161	CLASSIC FURNITURE SERVICES	90 HAYWARD ST	FRANKLIN	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
324823	FRANKLIN HIGHWAY GARAGE	40 HAYWARD ST	FRANKLIN	Fuel Dispenser	Fuel Dispenser
177743	FRANKLIN ENVIRONMENTAL SERVICES, INC	185 INDUSTRIAL RD	WRENTHAM	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
177743	FRANKLIN ENVIRONMENTAL SERVICES, INC	185 INDUSTRIAL RD	WRENTHAM	Generator of Hazardous Waste	Transporter of Hazardous Waste
177743	FRANKLIN ENVIRONMENTAL SERVICES, INC	185 INDUSTRIAL RD	WRENTHAM	Generator of Hazardous Waste	EPA Transporter of Hazardous Waste for Clean-Up
130568	CAMGER CHEMICAL SYSTEM	364 MAIN ST	NORFOLK	Plant	Air Quality Permit
130568	CAMGER CHEMICAL SYST	364 MAIN ST	NORFOLK	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
130568	CAMGER CHEMICAL SYSTEMS INC	364 MAIN ST	NORFOLK	Toxics Use Reduction Filer	Large Quantity Toxics User

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
FRANKLIN PAINT CO INC ID #12087	259 COTTAGE ST	FRANKLIN	Steel	**	**	6000	Fuel Oil
MOLLOYS GARAGE INC ID #12093	43 E CENTRAL ST	FRANKLIN	Cathodic	1 Wall	Approved In- Tank Monitor	10000	Gasoline
			Cathodic	1 Wall	Approved In- Tank Monitor	10000	Gasoline
			Cathodic	1 Wall	Approved In- Tank Monitor	10000	Gasoline
			Cathodic	1 Wall	Approved In- Tank Monitor	2000	Fuel Oil
			Cathodic	1 Wall	Approved In- Tank Monitor	2000	Waste Oil
HESS #21314 ID #12096	251 E CENTRAL ST	FRANKLIN	Reinforced	1 Wall	Approved In- Tank Monitor	10000	Gasoline
			Reinforced	1 Wall	Approved In- Tank Monitor	10000	Gasoline
			Reinforced	1 Wall	Approved In- Tank Monitor	10000	Gasoline
GETTY STATION #30662 ID #12100	71 E CENTRAL ST	FRANKLIN	Reinforced	2 Walls	Interstitial Monitoring	12000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	10000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	8000	Diesel
SHELL STATION ID #12104	140 E CENTRAL ST	FRANKLIN	Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
CAMGER CHEMICAL SYSTEMS INC ID #12350	364 MAIN ST	NORFOLK	Composite	2 Walls	Interstitial Monitoring	1500	Hazardous

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

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DEP Permitted Facilities:

CAMGER CHEMICAL SYSTEMS INC ID #12350	364 MAIN ST	NORFOLK	Composite	2 Walls	Interstitial Monitoring	1500	Hazardous
			Composite	2 Walls	Interstitial Monitoring	2500	Hazardous
DIPLACIDO CORP ID #30338	20 INDUSTRIAL RD	WRENTHAM	Steel	2 Walls	Interstitial Monitoring	8000	Diesel
KENNETH BLANCHARD JR ID #20572	682 FRANKLIN ST	WRENTHAM	Reinforced	2 Walls	Interstitial Monitoring	1000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank

** Information not available

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0015426	825 WASHINGTON ST	FRANKLIN	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Source Water Assessment Program (SWAP) Report For Freetown Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 14, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Freetown Elementary School
PWS Address	43 Bullock Road
City/Town	Freetown, Massachusetts
PWS ID Number	4102008
Local Contact	Robert Souza, Regional Facilities Manager
Phone Number	(508) 763-5121

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4102008-01G	200	503	Moderate
Well #2	4102008-02G	200	503	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The two (2) wells for Freetown Elementary School comprise a public water supply currently serving drinking water to approximately 570 students and staff. The two wells are referred to as Well #1 and Well #2. Well #1 is an 8-inch well drilled to a depth of 100 feet and is located in the former boiler room of the school. Well #2 is 8-inch well drilled to a depth of 290 feet and is located north of the school. Well #1 and Well #2 both have a Zone I and Interim Wellhead Protection Area (IWPA) of 200 and 503 feet, respectively, based on water meter readings of 4630 gallons per day (refer to attachments for calculation methodology). The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The well is located in an aquifer with a high vulnerability to contamination due to the

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

absence of hydrogeologic barriers (i.e. Clay) that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Storage, Use and Handling of Hazardous Materials and Oil,**
3. **Floor drains,**
4. **Protection Planning-Land Acquisition,**
5. **Septic System,**
6. **Stormwater Catchbasin,**
7. **An Aboveground Storage Tank (AST) With Heating Oil.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one Moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently; both wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Well #1 Zone I contains school buildings, septic tanks, pole transformers, athletic fields, school parking areas, and recreational activities. The Well #2 Zone I contains a dumpster, school buildings, school parking lot and landscaped areas. The public water supplier does own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not exceed the average daily withdrawal limit for this public water system of 4630 gallons per day.
- ✓ Do not use or store fertilizers or road salt within the Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Floor Drain	Well #1	Well #1, #2	High	Both boilers and all related equipment were removed from vicinity of Well #1
Storage, use, and handling of hazardous materials and oil	Well #1, #2	Well #1, #2	Moderate	Gasoline, lawnmowers, oil, paint, cleaning supplies, etc.
Parking lot, driveways & roads	Well #1, #2	Well #1, #2	Moderate	
Athletic Field	Well #1	Well #1, #2	Moderate	Fertilizer use
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the attachments
Fuel Storage Above Ground	No	Well #3	Moderate	12,000 gallon heating fuel tank, double walled, 110 percent secondary containment
Structures	Well #1, #2	Well #1, #2	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- V Well #2 is a vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider eliminating the well pit as part of any future modifications to Well #2.

2. **Storage, Use, and Handling of Hazardous Materials** – A storage room located adjacent to the gym is located within the Zone I of Well #1. There was no evidence of significant amounts of materials storage or spills. The school has speedy dry available for small spills and uses a salt substitute on the parking lots. Although the garage has a cement floor and there are no floor drains, the materials kept within the garage (gas cans, a lawnmower, boiler fuel additives, waste oil, paint, cleaning supplies, etc.) pose a potential treat to the well due to proximity and the potential for accidental release.

Recommendations:

- V It is recommended that an alternative storage facility, away from the Zone I be considered.

3. **Floor Drains** – A floor drain was observed in boiler room "A". According to school staff the floor drain is connected to the septic system. Discharge from boiler room floor drains is considered industrial waste water and MUST go to a DEP approved tight tank or the drains must be sealed, and staff should be trained on proper disposal of hazardous materials and hazardous waste disposal practices. In a September 14, 2001 letter to the Department, school staff indicated that during remodeling the boiler and all related equipment were removed including all underground oil lines.

Recommendation:

- V Seal the floor drain if the floor drain is not needed. Plumbing inspector approval is required before sealing the floor drain. Department form WS-1 is attached for this purpose.

4. **Comprehensive Wellhead Protection Planning**- Consider well relocation if Zone I threats cannot be mitigated. There is currently significant forest abutting the school property. This land may be able to provide a location for a new water source, which would have the appropriate Zone I radii. This new source would be to replace the existing nonconforming wells. The new well may become necessary if the school plans to expand or the existing wells are contaminated or cannot produce sufficient

quantities of water to supply the school.

Additionally, future development within the IWPA is a major concern. The Department observed recent development of surrounding properties during the site visit.

Recommendation:

- V Work with the Selectmen, Board of Health and Planning Board to monitor land uses within and proximal to the IWPA. Refer to the Wellhead Protection Plan guidance and model bylaws for types of activities that should be prohibited and managed in the vicinity of water supplies, at <http://www.state.ma.us/dep/brp/dws/files/whplan.doc>.
- V Create a Wellhead Protection Plan. Detailed instructions on many of these planning recommendations are listed in "Developing a Local Wellhead Protection Plan", available at <http://www.state.ma.us/dep/brp/dws/files/whplan.doc>.
- V Develop a Land Acquisition Plan. Land acquisition protects water supplies by limiting the land's development potential. Acquisitions can be accomplished by municipal and non-municipal water systems through conservation restrictions,

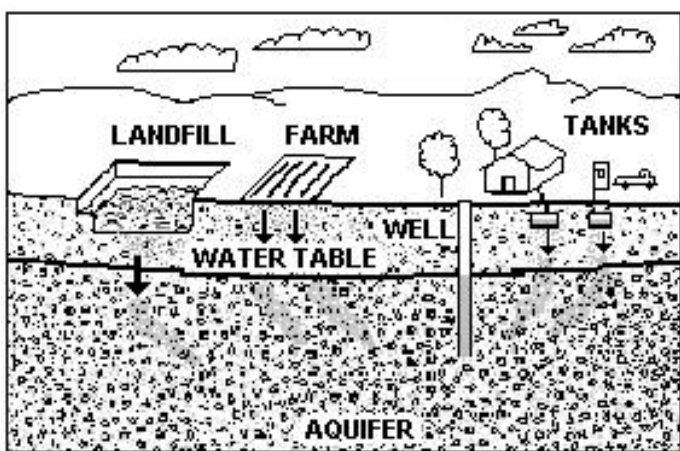


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

land banking, land purchases and land donation. Sample conservation restrictions are available at: <http://www.state.ma.us/dep/brp/dws/>.

5. **Septic Systems** - The septic system consists of leaching field located approximately 325 feet southwest of Well #1. If a septic system fails or is not properly maintained it is a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is also a potential source of contamination to the water supply.

Recommendations:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Educate workers on septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Workers should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>
- ✓ Monitor water usage, as exceeding the septic system design capacity could cause premature failure of the septic system.

6. **Storm Water** – Storm water generated from the school parking area and runoff from the roof is redirected out of the Zone I of Well #1. The discharge pipe for the storm water system was observed approximately 350 the north of Well #1 in a wooded area. Catch basins transport storm water from the school parking lot and driveway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- ✓ Have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ Consider nonstructural techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff. Additionally, the public water supplier may want to consider structural BMPs (e.g. stormwater swales, installation of curbs along the paved areas, detention basin, etc.) as part of a comprehensive storm water management plan for the site. To learn more refer to the *Storm Water Management Handbook, Volume 1 and 2* for information on BMPs and the other documents available at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm>.

7. **Aboveground Storage Tank (AST)** – A 12,000 gallons AST installed in 1999 is located in the IWPA for both wells. According to school staff, the tank is double walled, with 110% secondary containment capacity and has an overfill protection device. Freetown Elementary School is commended for its efforts to remove underground storage tanks in the Zone I of Well #1 and Well #2. A 5,000 and

2,500 gallon oil UST were removed from the Zone I of Well #1. A 10,000 gallon UST was removed from the Zone I of Well #2. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendations:

- ✓ Work with the local fire Department to ensure compliance with local code requirements regarding ASTs.
- ✓ During refilling of AST, ensure that the operator of the oil transport tanker does not leave the vehicle while the AST is being filled.
- ✓ Ensure that the delivery operator has determined the tanks available oil capacity to prevent overfilling (refer to 527 CMR 8.00).

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Pesticides are no longer applied at the Freetown Elementary School. Freetown should review and adopt the **key recommendations above** and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ If the school intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Drinking water signs were not observed during the SWAP site visit. Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that storm water runoff from town/state roads is directed away from the wells and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer and herbicides and on facility property.
- ✓ Two (2) telephone poles with transformers were observed within the Zone I of Well #1. For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
 - **Recommendation implemented:** The PCBs transformer near Well #1 has been replaced with a non-PCB transformer.

Planning:

- ✓ Work with local officials in Freetown to include the facility IWPA's in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Fertilizer Use Fact sheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- Wellhead Protection Area Calculation Sheet



**Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Stillwater Fasteners, Inc.**

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

**SWAP and
Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Stillwater Fasteners, Inc.
PWS Address	25 Gurney Road
City/Town	Freetown, MA 02717
PWS ID Number	4102015
Local Contact	Michael Goldberg/Frederick Parmenter
Phone Number	508-763-8044/508-947-1070

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	100	422	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

The well provides drinking water to Stillwater Fasteners, Inc. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 422 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. The Zone I and IWPA consist mostly of the Stillwater facility, residential development and undeveloped forest. There is also a local road that passes through the IWPA at the edge of the Zone I. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has corrosion control treatment approved by the Department. DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. **Zone I Issues, including a residence with a fuel tank**
2. **Machine/Metalwork Shop/Large Quantity Hazardous Waste Generator/Large Quantity Toxic User**
3. **Residential Development, including underground & above ground storage tanks**
4. **Transportation Corridor**

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Residential Development (fuel tanks, septic systems, lawn care)	Yes - residence & fuel tank	Yes	H	spills or leaks from fuel delivery & storage; microbial contaminants from septic systems; pesticides or fertilizers from lawn care
Machine/Metalwork Shop/ Large Quantity Hazardous Waste Generator (LQG); Large Quantity Toxic User (LQTU)	No	Yes	H	spills or leaks of hazardous materials and wastes
Transportation Corridor	edge	Yes	M	leaks or spills of fuel and other substances

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

The overall ranking of susceptibility to contamination for the well is HIGH based on the presence of at least one HIGH ranking in Table 2.

1. **Zone I** – The public water system owns or controls the Zone I, posts water supply awareness signs and conducts inspections.

Recommendations:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Continue to conduct regular inspections of the Zone I.

2. **Machine/Metalwork Shop/Large Quantity Hazardous Waste Generator (LQG) & Large Quantity Toxic Waste User (LQTU)** – the public water system is at a fastener company.

Recommendations:

- ✓ Use BMPs for handling, storing, using and disposing of hazardous materials.
- ✓ Reduce the use of hazardous and toxic materials if possible.
- ✓ Train employees in spill prevention.

2. **Residential Development** – The Zone I and IWPA consist of 38% residential development. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Recommendation:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

4. **Transportation Corridor - Stormwater** – A local road runs through the IWPA on the edge of the Zone I. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing. Spills from vehicular accidents can also contaminate public drinking water sources.

Recommendation:

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.

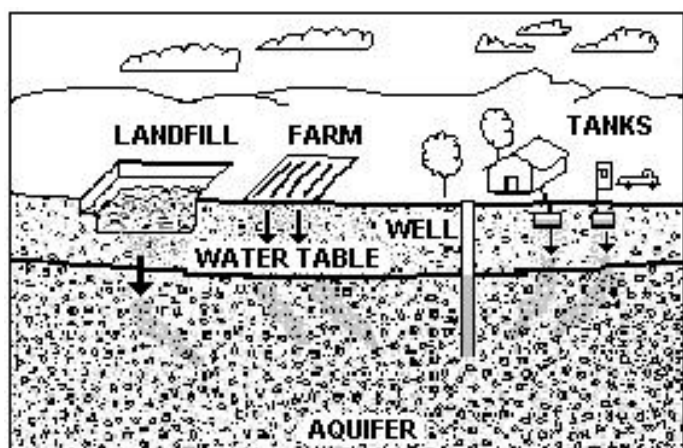


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. Facility operators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Continue to inspect the Zone I.

Training and Education

- ✓ Train employees on the proper use, handling, storage and disposal of hazardous chemicals.

Facilities Management

- ✓ Inspect and maintain any chemical containment structures.

Planning

- ✓ Work with local officials in town to make sure that the well's IWPA is included in a local Aquifer Protection District Bylaw and to assist you in improving protection.

Funding

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures fact sheet
- Residents Protection Drinking Water fact sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Gosnold Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Gosnold Water Department
PWS Address	Town Hall, Tower Hill Road, P.O. Box 28
City/Town	Cuttyhunk, Massachusetts 02713
PWS ID Number	4109000
Local Contact	Asa Lombard
Phone Number	(508) 990-7408

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Wellfield	01G	372	1840	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Town of Gosnold residents on Cuttyhunk Island receive their water from a wellfield consisting of five wells which is located on the west side of the Island. The wellfield has a Zone I of 372 feet and an Interim Wellhead Protection Area (IWPA) of 1840 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. Soda ash (anhydrous sodium carbonate) is added to the water pumped from the well to neutralize its natural corrosive chemistry. The DEP requires public water suppliers to

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

The IWPA contains some potential sources of contamination that if managed improperly could threaten the quality of water at the wellhead.

Key issues include:

1. **Zone I;**
2. **Historic landfill;**
3. **Septic system;**
4. **Road.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of one high threat within the IWPA.

1. **Zone I** – Currently, the well does meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I only contains the wells and related pumping facility. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- Do not use or store pesticides, fertilizers or road salt within the Zone I.
- Ensure any non-water supply activities remain out of your Zone I area.

2. **Historic Landfill** – A landfill is located within the IWPA southeast of the wells. Landfills have the potential to leak contaminants into the groundwater.

Recommendation:

- Monitor groundwater around the landfill to ensure that any contamination does not migrate toward your drinking water source.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Landfill	No	Yes	High	Contamination from leachate into groundwater.
Septic system	No	Yes	Moderate	bacteria, improper disposal of hazardous materials
Fishing /Boating	No	Yes	Low	Potential for fuel leaks.
Aquatic Wildlife	Yes	Yes	Moderate	Microbial contamination from fecal matter.

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

3. **Septic System** – A residential septic system is located within the IWPA.

Recommendation:

- Septic system components should be inspected and maintained on a regular basis.
- Educate residents on proper disposal of household hazardous materials.

4. **Road** – Part of a road is within the edge of the IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- Inspect access roads for illegal dumping.
- Ensure any spills are properly contained and cleaned-up.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Gosnold officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I to comply with DEP's Zone I requirements.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best

management practices; include certified operator and residents. Post labels as appropriate on raw materials and hazardous waste.

- ✓ Ensure drinking water protection area signs are posted at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff at the road is properly managed.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in an Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

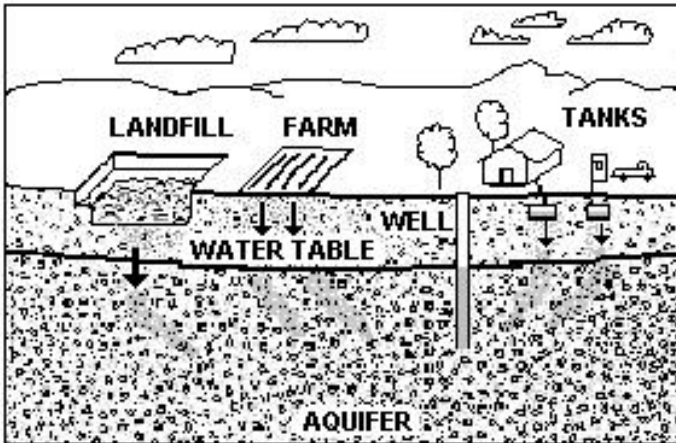


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Halifax Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Halifax Water Department
<i>PWS Address</i>	499 Plymouth Street
<i>City/Town</i>	Halifax, Massachusetts 02338
<i>PWS ID Number</i>	4118000
<i>Local Contact</i>	Richard Clark, Superintendent
<i>Phone Number</i>	(781) 293-1733

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

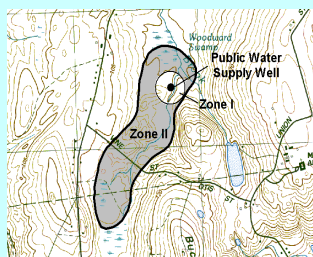
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 368

Susceptibility: Moderate

Well Names	Source IDs
Richmond Park Well #1	4118000-01G
Richmond Park Well #2	4118000-02G

Zone II #: 609

Susceptibility: High

Well Names	Source IDs
YMCA Well Site #3	4118000-03G

The Halifax Water Department receives its water from three gravel packed wells located in two Zone II source water protection areas, (see tables above). The Water Department is in the process of receiving approval for a fourth well to be located near the current YMCA Well #3, an assessment for this source is not included in this report. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All of the water receives some treatment before entering the distribution system. Water from the YMCA Well has potassium hydroxide added for corrosion control and chlorine added as a disinfectant. The Richmond Park Wells have potassium permanganate added for iron and manganese removal, sodium hydroxide added for corrosion control and chlorine added as a disinfectant. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Halifax are dominated by forest, residential and woody perennial (cranberry bogs) land uses. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Issues
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Issues – The Zone I for each of the wells is a 400 foot radius around

the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The three Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I Recommendations:

- ✓ To the extent possible, remove any non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land use is common in the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

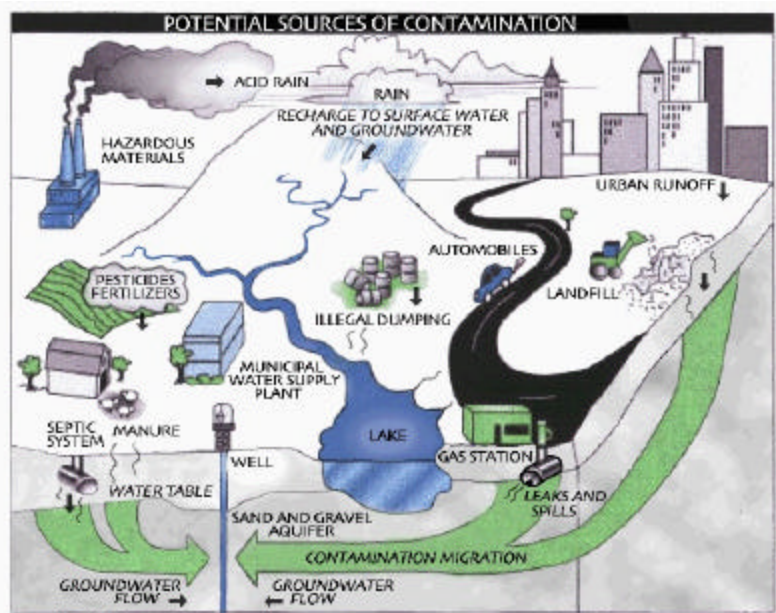
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 106 runs through the Zone II for the Richmond Park Wells. Local roads are located in both Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

4. Hazardous Materials Storage and Use –

Although no commercial or industrial land uses were identified during the assessment of Halifax's, activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business

(Continued on page 6)

Source Protection Decreases Risk

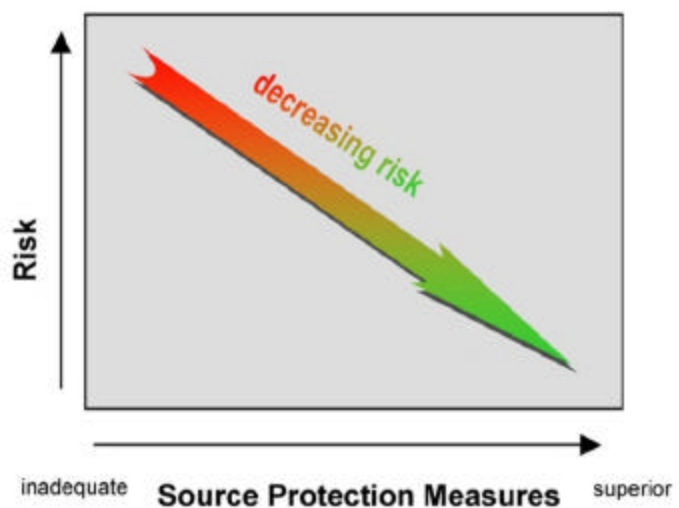


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	609	Fertilizers: leaks, spills, improper handling, or over-application (cranberry bog)
Pesticide Storage or Use	1	H	609	Pesticides: leaks, spills, improper handling, or over-application (cranberry bog)
Commercial				
Cemeteries	1	M	368	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids (historic)
Residential				
Fuel Oil Storage (at residences)	numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Fishing/Boating	some	L	Both	Fuel and other chemical spills, microbial contaminants
Stormwater Drains/ Retention Basins	some	L	Both	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	1	M	368	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Water Treatment Sludge Lagoon	2	M	Both	Sludge and wastewater: improper management

Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

6. Agricultural Activities – There are a number of cranberry bogs in the Zone II for the YMCA Well #3. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, Halifax reports that it has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2), however the DEP does not have records to indicate that final copies of the bylaws, protection district overlay maps and floordrain control regulations were submitted to DEP for approval. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Use your Protection Team to implement the goals outlined in your Wellhead

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Protection Plan.

- ✓ Submit local wellhead protection controls to DEP, include bylaws, overlay maps and floordrain regulations. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Refer to Table 2 and Appendix A for more information about other land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring any non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES/NO	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Contact Catherine Sarafinas of DEP to ensure all requirements are in place for formal DEP approval.
Do neighboring communities protect the Zone II areas extending into their communities?	NA	Work with neighboring municipalities and consider including their Zone IIs in your wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use your Wellhead Protection Committee to implement the goals of your Wellhead protection Plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Consider expanding the committee to include representatives from citizens' groups and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership of all the Zone I lands for Halifax's groundwater sources.
- Partnering with other Town Boards to assure that water supply protection is incorporated into their decision making.
- Developing a Wellhead Protection Plan.
- Establishing a Wellhead Protection Committee.
- Diligently patrolling the Zone Is and Zone IIs to identify potential problems before they can impact the water supply.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA**DEP Permitted Facilities**

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
No DEP permitted facilities were identified during the inventory.					

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No Department of Fire Services registered Underground Storage Tanks were identified during the inventory.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
No DEP Tier Classified Sites were identified during the assessment.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Hanover Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Hanover Water Department
<i>PWS Address</i>	40 Pond Street
<i>City/Town</i>	Hanover, Massachusetts
<i>PWS ID Number</i>	4122000
<i>Local Contact</i>	Douglas N. Billings
<i>Phone Number</i>	(781) 826-3189

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

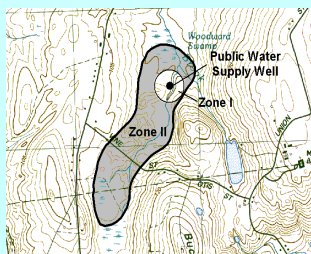
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 207

Susceptibility: High

Well Names	Source IDs
Philip C. Beal Well #1	4122000-09G
Philip C. Beal Well #2	4122000-10G

Zone II #: 255

Susceptibility: High

Well Names	Source IDs
Pond Street Well #1	4122000-01G
Pond Street Well #2	4122000-05G
Pond Street Well #3	4122000-08G

Zone II #: 280

Susceptibility: High

Well Names	Source IDs
Hanover Street Well #1	4122000-03G
Hanover Street Well #2	4122000-04G

Zone II #: 281

Susceptibility: Moderate

Well Names	Source IDs
Broadway Well #1	4122000-06G
Broadway Well #2	4122000-07G

Hanover Water Department receives its water from nine groundwater wells located in four Zone II recharge areas (see above table). The wells are located in the town of Hanover, however the Zone IIs extend into the neighboring communities of Norwell and Pembroke. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

Disinfectant is added at Pond Street Wells, Hanover Street Wells and Beal Wells. Pond Street and Beal Street Wells are filtered to remove small particles, and organisms such as sediment, iron and manganese. Additionally, all of the wells are treated for corrosion control through potassium hydroxide addition. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

A mixture of forest and residential land uses dominates the Zone IIs for Hanover with smaller areas of commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are

listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Issues
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Issues – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The nine Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Pond Street Well #1 4122000-01G – Parking for approximately six Water Department vehicles occurs within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land uses are common throughout the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

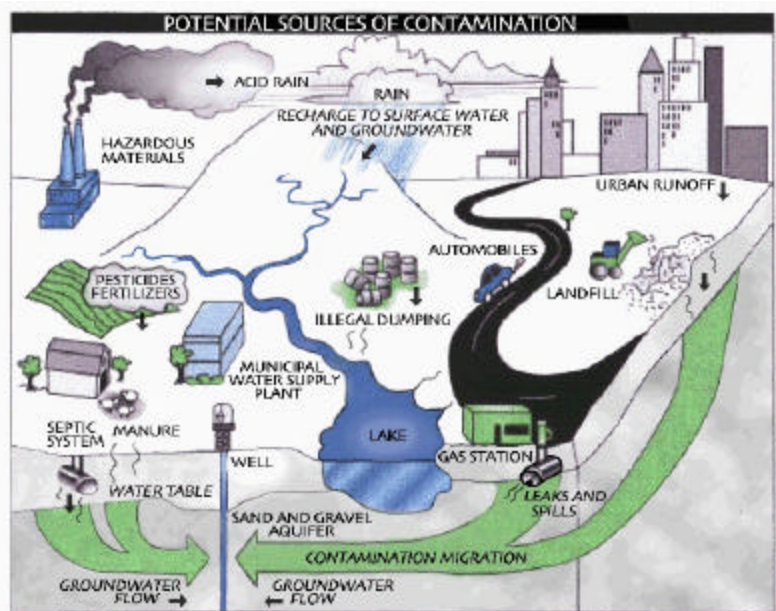
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents,

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 3 runs through the Zone II for the Pond Street Wells. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the

Zone I.

- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use – Small areas of the Zone IIs are used for commercial land uses. Activities associated with commercial and industrial land use are often the

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 942-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

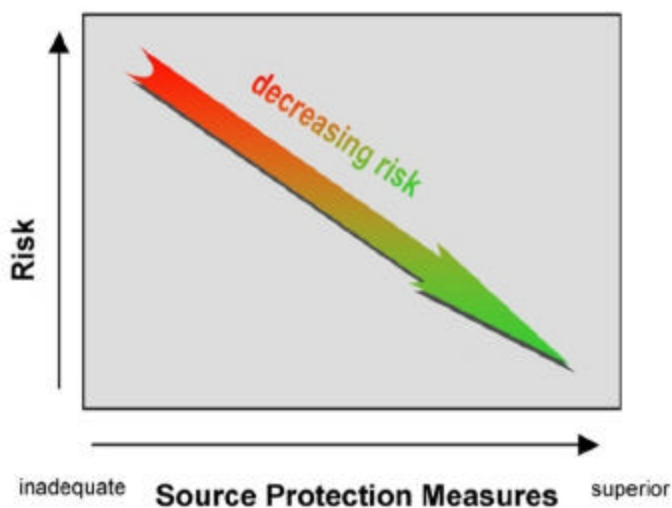


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Commercial				
Body Shops	5	H	#255 & #280	Vehicle paints, solvents, and primer products: improper management
Gas Stations	2	H	#207	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	5	H	#255 & #280	Automotive fluids and solvents: spills, leaks, or improper handling
Dry Cleaners	1	H	#255	Solvents and wastes: spills, leaks, or improper handling
Medical Facilities	4	M	#280	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (1 Veterinarian and 3 Dental Offices)
Industrial				
Fuel Oil Distributors	1	H	#255	Fuel oil: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal

*See Notes for Table 2 on page 6.

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous				
Fishing/Boating	1	L	#207	Fuel and other chemical spills, microbial contaminants
Oil or Hazardous Material Sites	1	--	#255	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Small quantity hazardous waste generators	Few	M	All	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Numerous	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	3	H	#207 & #255	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	Few	L	All	Hazardous materials and waste: spills, leaks, or improper handling or storage
Water Treatment Sludge Lagoon	3	M	#207, #255 & #281	Sludge and wastewater: improper management

Notes For Table 2:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II for the Pond Street Wells contains one DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 4-0001341. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, Hanover has not submitted all of the information required for review of whether local controls meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Protection Planning Recommendations:

- ✓ Establish a protection team, and use the team to implement the goals of the Wellhead Protection Plan for Hanover.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, gas stations, and fuel oil distributors. Refer to Table 2 and Appendix A for more information about these land uses.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	In the future don't allow any non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Hanover's "Aquifer Protection District" bylaw has not been reviewed to determine whether it meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring municipalities to protect current and future water supplies within your towns.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update plan as needed. Resources are available at "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Develop a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	NO	Provide source protection education to residents, schools and business owners within your Zone IIs.

(Continued from page 7)

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Coordination with Norwell to include local protection of the Zone II for the Pond Street Wells.
- Conducting daily inspections of the Zone Is.
- Gaining ownership or control of all the Zone I protection areas.
- Posting all of the Zone Is with “Public Drinking Water Supply Recharge Area” signs.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Establish a protection team to implement Hanover’s Wellhead Protection Plan.
- ✓ Continue daily Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Develop a formal “Emergency Response Plan”.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection’s Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 3

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
31127	DEPENDABLE SEWING MACHINE SERVICE	819 WASHINGTON ST	HANOVER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
34834	DEPENDABLE LAUNDERERS & CLEANERS	1376 WASHINGTON ST	HANOVER	Generator of Hazardous Waste	Small Quantity Generator
37818	AUTO ZONE #5115	880 WASHINGTON ST	HANOVER	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
38040	HANOVER BOARD OF HEALTH	118 ROCKLAND ST	HANOVER	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
39331	HANOVER LANDFILL	ROCKLAND ST/RTE 139	HANOVER	Sanitary Landfill	Landfill
39333	HANOVER TRANSFER & RECYCLING	ROCKLAND ST	HANOVER	Transfer Station	Transfer Station for Hazardous Material
39333	HANOVER TRANSFER STATION	HANOVER TRANSFER STATION	HANOVER	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
39333	HANOVER TRANSFER STATION	HANOVER TRANSFER STATION	HANOVER	Generator of Hazardous Waste	Small Quantity Generator
131311	MCGEE PONTIAC TOYOTA	860 WASHINGTON ST	HANOVER	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
131311	MCGEE PONTIAC TOYOTA	860 WASHINGTON ST	HANOVER	Generator of Hazardous Waste	Small Quantity Generator
132315	NORTH RIVER AUTO SERVICE	309 COLUMBIA RD	HANOVER	Fuel Dispenser	Fuel Dispenser
132315	NORTH RIVER AUTO SERVICE	309 COLUMBIA RD	HANOVER	Generator of Hazardous Waste	Small Quantity Generator
132870	HANOVER WATER TREATMENT PLANT	40 POND ST	HANOVER	Surface Water Facility (BRP)	Surface Water Discharge
133324	FISHER AIR FASTENERS	785R WASHINGTON ST	HANOVER	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
186605	TOMS SERVICE STATION	209 COLUMBIA RD	HANOVER	Fuel Dispenser	Fuel Dispenser
186605	TOMS SERVICE STA	103 COLUMBIA RD	HANOVER	Generator of	Very Small Quantity Generator of

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 2 of 3

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
				Hazardous Waste	Hazardous Waste
308655	CVS INC	35 COLUMBIA RD	HANOVER	Generator of Hazardous Waste	Small Quantity Generator
373970	BAGNELL AUTO SUPPLY	228 COLUMBIA RD	HANOVER	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
ALVIN HOLLIS & CO ID #78212	819 WASHINGTON ST	HANOVER	Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
			Steel	1 Wall	Inventory Record-Keeping	10000	Fuel Oil
NORTH RIVER AUTO SERVICE ID #30115	309 COLUMBIARD	HANOVER	Cathodic	2 Walls	Interstitial Monitoring	15000	Gasoline
			Cathodic	2 Walls	Interstitial Monitoring	8000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	500	Waste Oil
TOM'S AUTO SERVICE ID #13344	209 COLUMBIA RD	HANOVER	Composite	2 Walls	Interstitial Monitoring	10000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	8000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	6000	Gasoline
			Steel	1 Wall		250	Waste Oil
VERIZON MASSACHUSETTS #511106 ID #13336	319 COLUMBIA RD	HANOVER	Reinforced	2 Walls	Interstitial Monitoring	1000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0001341	MARTINIZING DRY CLEANERS	Hanover	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Hanson Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Hanson Water Department
<i>PWS Address</i>	1073 West Washington Street
<i>City/Town</i>	Hanson, Massachusetts 02341
<i>PWS ID Number</i>	4123000
<i>Local Contact</i>	Glen Doherty
<i>Phone Number</i>	(781) 447-1200

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

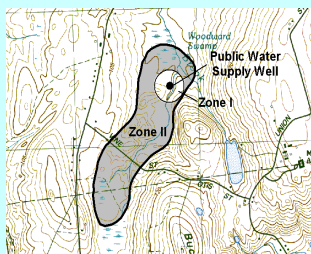
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 160

Susceptibility: High

Well Names	Source IDs
GP Well #1	4123000-01G
Crystal Spring Well	4123000-02G

The Hanson Water Department was created in 1916 by an act of the State Legislature. Prior to the development of its own source of water in the early 1980s the Hanson Water Department purchased all of its water from the City of Brockton and the Abington/Rockland Joint Waterworks. Currently Hanson operates two wells, the GP Well #1 and the Crystal Spring Well, located on Main Street. Hanson continues to augment its own supply by purchasing water from the City of Brockton; a SWAP report covering the City of Brockton's water supply sources is attached to this report. Hanson's wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Each well has a Zone I protection radius of 400 feet. Please refer to the attached map to view the boundaries of the Zone I and Zone II protection areas.

The Hanson Water Department has two proposed wells that it plans to add to its existing supply of drinking water. The proposed wells, 4123000-0BG and 4123000-0EG are not assessed as part of this report. However, these proposed wells and their corresponding protection areas are located on the attached map.

Both wells serving Hanson Water Department have potassium hydroxide and zinc orthophosphate added for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Hanson is dominated by forest and non-forested wetlands with small areas of cropland, residential, commercial, industrial and waste disposal land use (refer to attached map for details of land uses in Zone II #160). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Hanson's Zone I areas around the active wells are owned or controlled by the public water system. Horseback riders, hikers and hunters use the Zone I areas. Only water supply activities are allowed in the Zone I.

Zone I Recommendations:

- ✓ Keep all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Ensure floor drains in pump stations comply with the requirements outlined in DEP's 2001 Guidelines and Policies for Public Water Systems.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.
- ✓ Restrict access to Zone I areas.

2. Residential Land Uses – Approximately 7% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of

contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

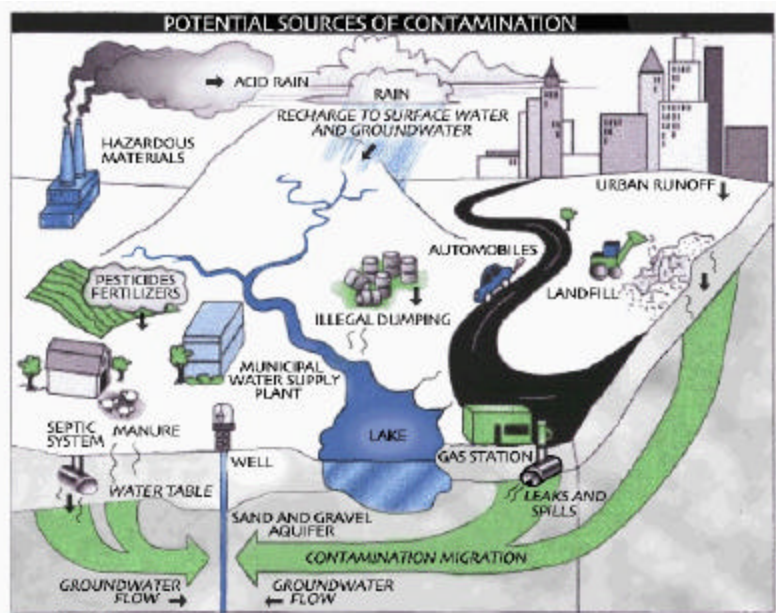
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 27 runs through the Zone II just south of the wells. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run through the water supply protection areas. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Ensure that drains discharge stormwater outside of the Zone Is.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

4. Hazardous Materials Storage and Use— Eight percent of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.

(Continued on page 7)

Source Protection Decreases Risk

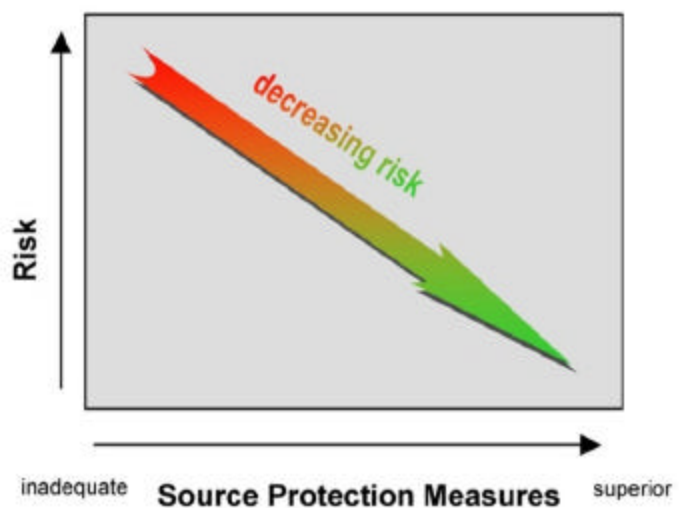


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Landscaping	1	M	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	Manure (microbial contaminants): improper handling (Non-commercial Pig Farm)
Manure Storage or Spreading	1	H	Manure (microbial contaminants): improper handling
Commercial			
Car/Truck/Bus Washes	1	L	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Body Shops	2	H	Vehicle paints, solvents, and primer products: improper management
Gas Stations	3	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	2	H	Automotive fluids and solvents: spills, leaks, or improper handling
Laundromats	1	L	Wash water: improper management
Printer And Blueprint Shops	1	M	Printing inks and chemicals: spills, leaks, or improper handling or storage
Railroad Tracks And Yards	1	H	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial			
Fuel Oil Distributors	1	H	Fuel oil: spills, leaks, or improper handling or storage
Industry/Industrial Parks	1	H	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Jewelry or Metalplating	10	H	Solvents, other chemicals, and process wastes: spills, leaks, or improper handling or storage

Activities	Quantity	Threat*	Potential Source of Contamination
Industrial - Continued			
Machine/Metalworking Shops	1	H	Solvents and metal tailings: spills, leaks, or improper handling
Residential			
Fuel Oil Storage (at residences)	Several	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Several	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Several	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aboveground Storage Tanks	Several	M	Materials stored in tanks: spills, leaks, or improper handling
Clandestine Dumping	1	H	Debris containing hazardous materials or wastes
Fishing/Boating	1	L	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	Seepage of leachate (Closed and capped)
Oil or Hazardous Material Sites	2	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified
Road And Maintenance Depots	1	M	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Several	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Several	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Waste Transfer/ Recycling Station	1	M	Water contacting waste materials: improper management, seepage, and runoff (At old landfill)
Underground Storage Tanks	Few	H	Stored materials: spills, leaks, or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000781 and 4-0001087. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There is a small pig farm for personal use within the Zone II. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

7. Protection Planning – Currently, the town of Hanson does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Protection Planning Recommendations:

- ✓ Establish a protection team to implement the long term protection measures outlined in your wellhead protection plan.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, gas stations, laundromats, a print shop and machine shops. Refer to Table 2 and Appendix A for more information about these land uses.



(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Hanson meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with East Bridgewater to include wellhead protection controls for Hanson's Zone IIs in their community.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use a wellhead protection committee to implement goals of wellhead protection plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	NO	Include commercial, industrial and municipal uses within the Zone II. Utilize schools and public access channels.

(Continued from page 7)

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Ownership of the Zone IIs of the active wells.
- Developing a Wellhead Protection Plan.
- Adopting the local bylaws and health regulations to meet DEP's Wellhead Protection Controls.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone IIs regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Make local bylaw and health regulation inspections within Zone II a priority.
- ✓ Convene a Wellhead Protection Committee with members representing local government, businesses, citizen's groups, the water department and other stakeholders.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
None Identified for Hanson's Zone II.						

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
None Identified for Hanson's Zone II.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000781	1615 MAIN ST RTE 27	HANSON	Hazardous Material
4-0001087	1158 MAIN ST	HANSON	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Harwich Water Department

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Harwich Water Department
<i>PWS Address</i>	196 Chatham Road
<i>City/Town</i>	Harwich, Massachusetts
<i>PWS ID Number</i>	4126000
<i>Local Contact</i>	Deborah Fuller
<i>Phone Number</i>	508-432-0304

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

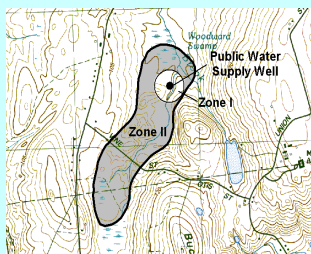
Refer to Section 2 and Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 97

Susceptibility: High

<i>Well Name</i>	<i>Source ID</i>
GP Well #1	4126000-01G
GP Well #2	4126000-02G
GP Well #3	4126000-03G
Main Station	4126000-04G
GP Well #4	4126000-05G

Zone II #: 98

Susceptibility: High

<i>Well Name</i>	<i>Source ID</i>
GP Well #5	4126000-06G
GP Well #6	4126000-07G
GP Well #7	4126000-08G

Zone II #: 99

Susceptibility: High

<i>Well Name</i>	<i>Source ID</i>
GP Well #8	4126000-09G
GP Well #9	4126000-10G

Zone II #: 29

Susceptibility: High

<i>Well Name</i>	<i>Source ID</i>
GP Well #10	4126000-11G

Zone II #: 362

Susceptibility: Moderate

<i>Well Name</i>	<i>Source ID</i>
GP Well #11	4126000-12G

Harwich Water Department is operated and maintained by the Town of Harwich, and is governed by a three-member board of water commissioners. The Town of Harwich Municipal water system is supplied by twelve (12) wells that draw water from the Monomoy Lens aquifer on Cape Cod. Each well has a Zone I of 400 feet. The twelve (12) wells are encompassed by five separate Zone IIs (refer to attached map of Zone I and Zone II for individual well locations). The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration.

Water from each of Harwich's 12 wells is treated for corrosion control by the addition of potassium hydroxide at five (5) treatment stations. For additional

information on monitoring results and treatment and for a copy of the most recent Consumer Confidence Report please contact the Public Water System contact person listed above in Table 1.

Section 2: Discussion of Land Uses in the Protection Areas

There are five (5) Zone IIs for the town of Harwich's twelve (12) groundwater wells. Each Zone II in this report is identified by a unique Zone II identification number. A list of the individual drinking water sources with its respective Zone II is provided in Section 1.

The Zone IIs for Harwich are mainly a mixture of forest and residential land uses (refer to attached maps for details). There also exist a number of land uses and activities that are potential sources of contamination. Key issues (1-6) are discussed in this section with a complete listing in Table 2, and further details provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in the Appendix.

Key issues include:

1. Inappropriate Activities in Zone Is
2. Residential Land Uses and Activities within Zone IIs
3. Comprehensive Wellhead Protection Planning for Zone IIs
4. Stormwater Pollution within Zone IIs
5. Transmission Line Right-of-Way within Zone IIs
6. Transportation Corridor within Zone IIs

The individual ranking of susceptibility to contamination for Harwich Zone IIs is listed in Table 1, based on the threat ranking of land uses within the Zone IIs, as seen in Table 2.

1. Zone Is - The Zone I for each of the Harwich wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The twelve (12) Zone Is for the town of Harwich's wells are owned or controlled by the public water

system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone I of Harwich's wells:

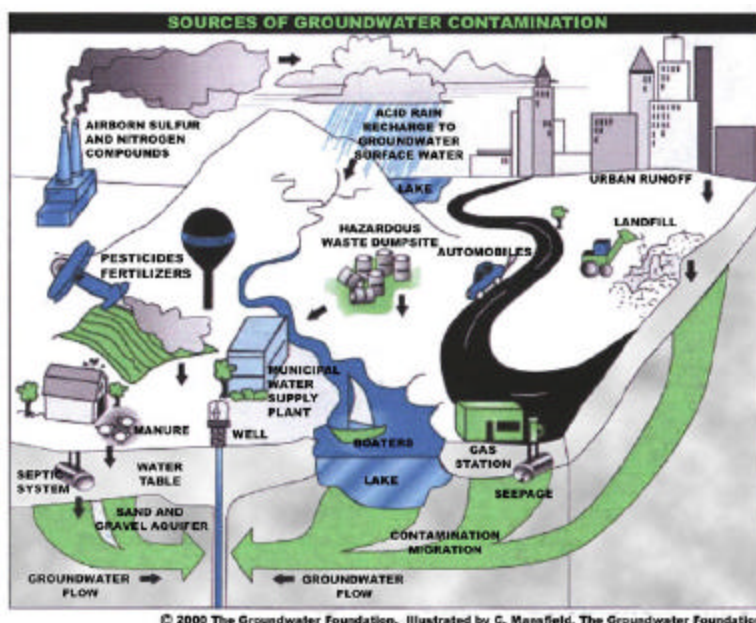
Zone I: Main Station 4126000-04G - The main station wellfield and pumping station has been in operation since the 1930s. This area acts as a system headquarters and district office activities associated with water supply operations (e.g. maintenance of equipment). The main station source consists of a wellfield comprised of four shallow wells (26 feet deep) with a vacuum pump system. The wellfield is located around the grounds of the Harwich Water

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Department buildings. Lubricating and chemical storage, truck parking and bulk chemical storage (in containment) and bulk lubricants are located within the Zone I of the main station well. Over the years the town has made significant improvements to the Zone I. In the late 1980s and early 1990s the Water Department undertook the following improvements to the Zone I;

1. Four (4) catch basins that there were located in the Zone I were removed and parking lot runoff was redirected away from the main well.
2. A 5000 gal. underground storage tank was removed from the main station area.
3. An aboveground storage tank for the backup diesel generator was removed in the early 1990s.
4. A septic system was relocated outside of the Zone I.

Zone Is: 4126000-01G, 02G, 03G, 06G, 08G, 09G, 10G - Utility transmission lines right-of-ways exist through Zone Is of the aforementioned wells. Additionally, the Cape Cod bike path is located in the Zone I of wells 01G, 02G, 03G, 06G and 08G.

Recommendations—Zone I

- v To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- v Keep non water supply activities out of the Zone I.
- v Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. Residential Land Use - If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Fertilizers and pesticides contain hazardous chemicals that can travel through the soil and contaminate ground water if over-applied. Pet waste may contain bacteria, parasites, or viruses that are a health risk. Water supplies may also be threatened from improper use and disposal of chemical products used in homes or businesses. Steps to educate residents and businesses on proper disposal of these materials is the best defense from pollution.

Residential Recommendations - Household Hazardous Waste:

- v **Proper Disposal** - Educate residents on the problem of disposing of hazardous materials in landfills, septic systems, wastewater treatment plants, storm drains, and on the ground. Encourage residents to use the Town of Harwich's Household Hazardous Waste Collection center. The Town of Harwich operates a permanent household hazardous waste collection center at the Harwich transfer station. The Town of Harwich accepts all paints and paint related products as well as all automotive products (batteries, antifreeze, motor oil etc.) for recycling. Very small quantity generators (VSQG) of hazardous waste and waste oil can use the facility for a fee.
- v **Alternative Products** - Provide residents with information on options that are available to substitute less hazardous substances for many products used in the home.

Residential Recommendations - Septic systems:

- v **System Care** - Educate residents on private septic systems about using cleaning compounds that are safe for the septic system, and on proper disposal practices, i.e. only sanitary waste in the septic system. Information on septic

What are "BMPs?"

Best Management Practices are structural (i.e. oil & grease trap catch basins), nonstructural (i.e. hazardous waste collection days) or managerial measures that are used to protect and improve surface water and groundwater quality.

systems can be found at Massachusetts Department of Environmental Protections website <http://www.state.ma.us/dep/brp/files/yoursyst.htm>.

- v **Proper Disposal** - Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly - not in septic systems.

Residential Recommendations - Lawn Care and Landscaping:

- v **Environmentally Sound Lawn Care** - Provide educational materials to residents about the proper application of pesticides or fertilizers. Landscape with native grasses, native flowering plants and trees and shrubs. Once established, native plants require less water and may not require fertilizer, herbicides or pesticides use. Encourage the use of native plants and



landscaping by establishing a demonstration area at a town facility. Information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's website at <http://www.massdfa.org>.

Residential Recommendations - Heating Oil Tanks:

- v **Underground Storage Tanks** - Since 1989, the Town of Harwich has a fuel storage system regulation. The Town of Harwich has reduced the number of underground storage tanks in the town significantly over the last decade through its program of education, testing and regulation. The regulations specify that fifteen years after installation, each tank and its piping is required to undergo tightness testing annually. Additionally, tanks older than 30 years must be removed. The Town of Harwich identified underground storage tanks at residential properties in and adjacent to Zone II as part of pilot project with the Department of Environmental Protection. Barnstable County Department of Health and the Environment (<http://www.CapeCod.net/bcdhe/oil/oil.htm>) maintains a database of underground storage tanks in the town of Harwich. A common source of heating oil leaks is the delivery or supply line that carries home heating oil from the storage tank to the furnace (refer to fact sheet "Heating Oil Delivery Lines, Homeowner's Guide to Preventing Leaks" included in the appendix). Target remaining homeowners with underground storage tanks in Zone II for education and outreach.
- v **Aboveground Storage Tanks** - Provide educational materials to residents regarding the proper storage of liquid petroleum products in aboveground storage tanks. The Department requires all wellhead protection zoning and non zoning controls to prohibit the siting of liquid petroleum products storage in Zone II unless such storage is aboveground, on an impervious surface and either in a container or in an aboveground tank within a building, or in an area that has a containment system designed and operated to hold either 10 percent of the total possible storage capacity of all containers, or 110% of the largest container storage capacity whichever is greater. Consult with the local fire department for any additional local code requirements regarding aboveground storage tanks. A fact sheet on basement and outside oil tanks can be obtained from the Barnstable County Department of Health And Environment at <http://www.CapeCod.net/bcdhe/oil/oil.htm>.

3. Comprehensive Wellhead Protection Planning - Protection planning prevents drinking water contamination by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are numerous resources available to help communities in developing a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- v **Prevent new development in the Zone II** - The town should continue to purchase potentially developable land located within the existing wellhead protection areas and areas for use as future well sites.
- v **Develop a land acquisition plan** - Land acquisition projects protect water supplies by limiting the land development potential. Acquisitions can be accomplished by municipal water systems through conservation restrictions, land banking, land purchases and land donations. Sample conservation restrictions are available at: <http://www.state.ma.us/dep/brp/dws/>. The Town of Harwich is fortunate that its Zone IIs still have significant forest (refer to attached maps for percentage of forest). However, future development of Zone II is a major concern. The Department recommends that the town acquire Zone II land closest to the Zone I or land that is subject to high-risk development refer to <http://www.state.ma.us/dep/brp/dws/> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan").
- v **Priority Land Acquisition Assessment Project** - The Cape Cod Commission has recently completed a priority land acquisition assessment project for several Cape Cod communities, including Harwich, through a Massachusetts Department of Environmental Protection 604 (b) water quality management planning grant program. The Cape Cod Commission completed the project in two phases through grant # (97-02) and grant # (99-01). In the first phase the Cape Cod Commission reviewed and assessed specific land parcels that potentially could support a water supply or could be used for current wellhead protection. In the second phase a detailed assessment was completed for specific sites identified with the highest potential for water supply development. The objective of the first phase project was to aide towns in assessing properties that may be suitable for future water supply development or protection of existing water supply sources. Copies of the two reports were issued to each public water supplier included in the assessment project.
- v **Inspection Program** - Develop and implement an Inspection Program for facilities that generate, use, store, or dispose of hazardous/toxic materials. Local Board of Health and Building Inspectors working on inspections often include floor drain and underground storage tanks. Local inspection programs can provide valuable technical assistance on Best Management Practices.
- v **Develop a Wellhead Protection Plan** - Establish a local team, and refer them to <http://www.state.ma.us/dep/brp/dws/> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".

- v **Local Controls** - Coordinate efforts with local officials in Brewster and Chatham to compare existing controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://www.state.ma.us/dep/brp/dws/>.

4. Stormwater – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Stormwater Recommendations:

- v **Inspect, Maintain, and Clean** - Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in runoff. Note: Catch basin cleanings are classified as solid waste by DEP and must be handled and disposed in accordance with all regulations, policies, and guidance. In the absence of written approval from DEP, catch basin cleanings must be taken to a facility permitted by DEP to accept solid waste. For information on DEP's Nonpoint Competitive Grants Program Upcoming Funding Opportunity refer to: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm#wpa>.
- v **Best Management Practices** - Work with the Town to develop Best Management Practices that are the most effective, practical means of preventing or reducing pollution from nonpoint sources. Information is available at <http://www.epa.gov/OWOW/NPS/roads.html>.
- v **Local Controls** - Encourage local officials to develop a local stormwater ordinance. For more information see <http://www.epa.gov/owow/nps/ordinance/stormwater.htm>.
- v **Storm Drain Stenciling Program** - Work with local watershed groups to institute a Storm Drain Stenciling Program. For more information on how to develop a storm drain stenciling program go to <http://www.earthwater-stencils.com>
- v **Stormwater Planning** - Encourage local officials to become familiar with and begin to implement a stormwater management program to meet DEP's

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

- 1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- 2. MA DEP SWAP Strategy
- 3. Land Use Pollution Potential Matrix
- 4. Draft Land/Associated Contaminants Matrix

Phase II Storm Water Regulations. For additional information, refer to the Stormwater Management Information at <http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm>.

5. Transmission Line Right-Of-Way –An utility right-of-way runs through the Zone I of wells 4126000-01G, 02G 03G, 06G, 07G 08G, 09G 10G. The utility currently does not use herbicide for vegetative control on its right-of-way's. Over-application or improper handling of herbicides during right-of-way maintenance is a potential source of contamination. The rights-of-way management regulations (333 CMR 11) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and aims to protect drinking water wells and environmentally sensitive areas. Any company or agency proposing to use an herbicide must use applicators that are certified or licensed by the Department. Industries proposing to clear or maintain right-of-ways with herbicides submit a five-year vegetative management plan (VMP). These plans are subject to review by the Department, and advisory panel, the public and municipalities. Yearly operational plans are also submitted to the Department of Food and Agriculture and municipalities in which proposed herbicides spraying is expected to take place. Final acceptance of these plans is considered only when all concerns and recommendations are addressed.

Transmission lines Right-of-Way - Recommendations:

- v **Best Management Practices** - Work with utility company, and local officials during their review of the transmission line right-of-way Yearly Operating Plan to ensure Best Management Practices are implemented with regard to vegetation control in the Zone II, and that herbicides are not used in the Zone Is.
- v Identify any other right-of-way in your Zone II that may require vegetative control. Common rights-of-ways are railroad, electric, gas, water, telephone, and telecommunication services.

6. Transportation Corridor - Route 6 runs through the Zone II for well 4126000-12G. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. De-icing salt washes off into storm drains or onto adjacent ground. In addition, roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

Transportation Corridor - Recommendations:

- v **Emergency Response Planning** - Contact local fire department to ensure the Zone II is in emergency response planning.
- v **Low Salt Areas** - Encourage water districts and towns to educate employees and private contractors of the restrictions in designated Low Salt Areas.
- v **Planning and Developing** - Notify town officials of EPA's Intermodal Surface Transportation Efficiency Act. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 contains provision for the planning and developing of highway systems and transportation enhancement activities, including the mitigation of water pollution due to highway runoff. Through ISTEA, states are able to use a portion of their federal funding allotment for runoff pollution control devices and other BMPs to prevent polluted runoff from reaching their lakes, rivers, and bays.

Other land uses and activities that may be potential sources of contamination include: agriculture, landfills, dry cleaners, photo processors, very small quantity generators of hazardous waste or waste oil, small quantity generators of hazardous waste or waste oil, auto repair shops, underground storage tanks, horse tables, and shooting range. Refer to Table 2 and Appendix 2 for more information about these land uses and potential sources of contamination.

Agricultural - Approximately 3 percent of the Zone II #29 is comprised of cranberry bogs. As is the case for most other crops the commercial production of cranberries usually requires input of fertilizer and pesticides. Utilization of best management practices (BMPs) as planned and described in an established conservation farm plan can ensure that agricultural system will uphold the integrity of the surrounding natural resources.

Cranberry Bog - Recommendations:

- v **Encourage Cranberry bog owner/operator to:**

1. Obtain and follow an approved USDA, Natural Resource Conservation Service Conservation Farm Plan.
2. Maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.

Wood waste Landfill - T.W. Nickerson wood waste landfill is located on Chatham and Harwich Town Line (Zone II #98). For additional information refer to Appendices or contact DEP, Division of Solid Waste Management.

Photo Processor - The photo processor is located in Zone II #99 and is registered with the Department as a very small quantity generator of hazardous waste. Information on the requirements for photo processors are available at the Departments web site <http://www.state.ma.us/dep/erpubs.htm>.

Dry cleaners - The dry cleaners located in Zone II # 97 is registered through the Environmental Results Program (ERP) and as a Very Small Qty Generator of Hazardous Waste. The ERP program streamlined existing pollution control requirements for dry cleaners.

Recommendations: The dry cleaners should review its ERP certification and the dry cleaners certification workbook. Refer to Appendix for recommendations and additional information.

Underground Storage Tank - Cranberry Valley golf course has a 2000 gallon gasoline underground storage tank that is double walled with interstitial monitoring. An UST is a concern in Zone II #97 due to the potential threat posed by the release of its contents. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store. Work with the local fire Department and UST owner to

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix 2: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II ID #	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	2	M	#29	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	2	H	#29	Pesticides: leaks, spills, improper handling, or over-application (cranberry bogs)
Commercial				
Service Stations/ Auto Repair Shops	1	H	#99	Automotive fluids and solvents: spills, leaks, or improper handling, 1-1000 gal. AST in a vault,
Dry Cleaners	1	H	#97	Solvents and wastes: spills, leaks, or improper handling, ERP-dry cleaners, VSQG
Golf Courses	1	M	#97	Fertilizers or pesticides: over-application or improper handling
Nursing Homes	1	L	#29	Groundwater discharge permit for wastewater treatment facility, Microbial contaminants
Photo Processors	1	H	#99	Photographic chemicals: spills, leaks, or improper handling or storage ,VSQG- hazardous waste
Sand And Gravel Mining/Washing	1	M	#98	Heavy equipment, fuel storage, clandestine dumping: spills or leaks, also the site of a former shooting range
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Stables	Several	L	#29,#97	Horse Barn: manure

Activities	Quantity	Threat*	Zone II ID #	Potential Source of Contamination
Miscellaneous				
Aquatic Wildlife and pet waste	Numerous	L	All	Microbial contaminants
Landfills and Dumps	1	H	#98	Seepage of leachate (T.W. Nickerson-woodwaste landfill-SD 0055. 003)
Schools, Colleges, and Universities	1	M	#97	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage, (Harwich Jr. senior high school) playing fields and parking areas in the Zone II only
Small quantity hazardous waste	1	M	#99	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type:	1	L	#97, #98, #99	Corridor maintenance pesticides: over-application or improper handling; construction (Zone I 01G-03G)
Transportation Corridors	2	M	#362	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper
Underground Storage Tanks	1	H	#97	Stored materials: spills, leaks, or improper handling (2000 gallon gasoline tank, double walled, cathodic)
Very Small Quantity Hazardous Waste	4	L	#99	Hazardous materials and waste: spills, leaks, or improper handling or storage
<p>Water Supply Protection Area % that is Sewered = 0%</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential source of contamination, may contain other potential source of contamination, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. 2. For more information on regulated facilities, refer to Appendix : Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. 3. There were no Oil or Hazardous Materials Sites in Harwich's protection areas. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

ensure compliance with local code requirements regarding USTs. During refilling of UST, the UST owner should ensure that the operator of the oil transport tanker does not leave the vehicle while the UST is being filled. For additional recommendations and information refer to Appendix.

Auto repair shop – Stagg Chevrolet is located within Zone II #99. The facility is a small quantity hazardous waste generator (SQM) and has a 1000 gal. aboveground storage tank located in a vault. Due to the daily operations this facility generates small quantities of hazardous waste. This facility is registered as a small quantity waste generator with the Department and has a contract with a licensed hauler to remove the hazardous waste off-site. Hazardous waste is a potential source of contamination if it is improperly handled or stored. Stagg Chevrolet received a notice of noncompliance on January 25, 1999 for an unpermitted discharge to ground (floor drain). For recommendations and additional information refer to appendix.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect the Harwich wells.

Section 3: Source Water Protection

Implementing source protection measures and Best Management Practices (BMPs) will reduce the Harwich Water Supply System's susceptibility to contamination. Additional source protection recommendations are listed in Table 3 and the Key Issues above.

Harwich is commended for promoting source protection measures:

- In 1999 and 1998 Harwich Water Department received first-place in the Department Drinking Water Awards large community system-ground water category program. In addition in 1999 Harwich Water Department won first -place for the best overall "public water system".
- A chain-link fence was erected for water supply protection purposes between the water supply area associated with sources-06G, 07G and 08G and the Cape Cod Bike Trail.
- The Town of Harwich and the Department completed a pilot site discovery project that evaluated facilities that may pose a risk to the drinking water supplies in 1999. The Harwich Water Department, board of health, and fire department identified sites for further assessment investigation. Several facilities received a site visit and one (1) notice of noncompliance was issued for a floor drain discharging to ground at an auto retail facility in the Zone II.

In addition to the current efforts and the specific recommendations listed with the key issues, water suppliers are encouraged to pursue the following protection measures. Appendix 1 includes further recommendations.

➤ Partner with Local Businesses:

Since many small businesses and industries use hazardous materials and produce hazardous waste products, it is essential to educate the business community about drinking water protection. Encouraging partnerships between businesses, water suppliers, and communities will enhance successful public drinking water protection practices.

- v Work with golf courses to ensure that BMPs are in place for the handling and application of fertilizers and pesticides.
- v Work with sand and gravel operations to ensure that BMPs are in place for fuel storage and the prevention of clandestine dumping. The town should investigate the parcel of land (former sand and gravel pit) located off Depot road to determine if this area was once used as a shooting range. Additional information on shooting ranges is available on the Department web page at <http://www.state.ma.us/drp/files/pbshot/leadshot.htm>.

➤ Provide Outreach to the Community:

Public education and community outreach ensure the long-term protection of drinking water supplies. Awareness often generates community cooperation and support. Residents and business owners are more likely to change their behavior if they know where the wellhead protection recharge area is located, what types of land uses and activities pose threats, and how their efforts can enhance protection.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue to improve Zone I by removing non water supply activities within the Zone I to the extent feasible .
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town of Harwich's "Aquifer Protection District" bylaw meets DEP's requirements. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	?	Work with Brewster, Chatham, and Dennis municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	The Town of Harwich has a Board of three water commissioners. Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	The town is encouraged to continue this program, and to include municipal facilities. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at residential, commercial and municipal uses within the Zone II.

➤ **Plan for the Future:**

One of the most effective means of protecting water supplies is planning, such as the adoption of local controls to protect watersheds and ground water. These controls may include health regulations, general ordinances, and zoning bylaws that prohibit potential sources of contamination from wellhead protection areas.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. These recommendations are only part of your ongoing local drinking water source protection.

Additional Resources Available for Source Protection:

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

The assessment and protection recommendations in this SWAP report are provided as a tool to spur community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities.

The Harwich Water Department should supplement this SWAP report with local information on potential sources of contamination and land uses. To aid in the protection of the wells, local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Funding Resources:

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing Water Supply Source Protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. For additional information, please refer to the program fact sheet from this year. Please note: each year DEP posts a new Request for Response for the Grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://www.state.ma.us/dep/brp/mf/mfpubs.htm>.

Section 4: Appendices

1. Protection Recommendations
 - Outreach to Residents and the Community
 - Planning
 - Partnering with Local Businesses
2. Regulated Facilities within the Water Supply Protection Area

For More Information

Contact Mark Dakers in DEP's Lakeville office at (508) 946-2847 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

3. Data Sources and Additional Documents on Source Protection in Harwich
 - *A Reference Guide for Homeowners, Your Septic System, DEP pamphlet-1990*
 - *A Homeowner's Guide to Avoiding Costly Heating Oil System Weeks, DEP pamphlet 1994*
 - *Industrial Floor Drains, Common Questions about the UIC Program , DEP pamphlet-June 1998*
 - *Summary of Recommended Source Water Protection Measures*
 - *Important Health Environmental Information for Oil Users, Cape Cod Commission pamphlet*

- *Source Protection Resources (web pages)*
 - *Protecting Water Sources from Fertilizer, Department of Food and Agriculture*
 - *Protecting Groundwater from Pesticides, Massachusetts Department of Food and Agriculture*
 - *Heating Oil Delivery Lines, A Homeowner's Guide to Preventing Leaks, DEP pamphlet-2001*
 - *Source Water Protection Grant Program/Wellhead Protection Grant Program Fact Sheet*
 - *Homeowner Guide to Environmentally Sound Lawn care, Massachusetts Department of Food and Agriculture*
 - *Hazardous Waste for Golf Courses, DEP fact sheet 12/97*
 - *Manure Management for Healthy Horses, DEP pamphlet October 2000*
4. Maps of the Public Water Supply (PWS) Protection Areas

APPENDIX 2: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
245510	Cranberry Point Nursing Home	111 Headwaters Drive	Harwich	Wastewater discharge	Groundwater discharge permit	Nursing home
131476	Cape Cod Auto Mall	182 Route 137	Harwich	Generator of Hazardous Waste	Small Quantity Generator	Auto repair/sales
293837	Jiffy Cleaners Inc.	1421 Route 39	Harwich	Generator of Hazardous Waste	Very Small Quantity Generator, Environmental Results Program	Dry Cleaners
	Stop & Shop Supermarket Company	Routes 39 and 137	Harwich	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil	Supermarket
	Vollers Design	173 Bay Road	Harwich	Generator of Hazardous Waste	Very Small Qty Generator of Hazardous Waste	Photochemicals
	Harwich Jr., Senior High School	Oak Street	Harwich	Air quality permit	Minor Stationery Source	Heating plant

Underground Storage Tanks ¹

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Cranberry Valley Golf Course	183 Oak Street	Harwich	Golf course	2 Wall	Interstitial	2000	Gasoline

Solid Waste Facilities

Facility Identification Number	Facility Name	Address	Town	Permitted activity	Activity class	Facility description
SL0055.001	T.W. Nickerson Stump landfill	160 Mill Hill Road	Chatham	Landfill	Wood Waste Landfill	Solid Waste Facility

1. For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site:
<http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Hingham/Hull Water Supply

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Aquarion Water Company of Massachusetts
<i>PWS Address</i>	P.O. Box 336
<i>City/Town</i>	Accord, Massachusetts 02061-0336
<i>PWS ID Number</i>	3131000
<i>Local Contact</i>	Eileen Commene
<i>Phone Number</i>	(781) 740-6633

Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Section 1: Description of the Water System

Groundwater Sources

Zone II #: 394

Source Name	Source ID#	Susceptibility
Free St. Well #1	3131000-01G	High
Free St. Well #2	3131000-02G	High
Scotland St. Well	3206000-03G	High
Downing St. Well	3206000-04G	High
Free St. Well #3	3206000-05G	High
Prospect Well	3206000-06G	High

Surface Water Sources

Source Name	Source ID#	Susceptibility
Accord Pond	3206000-01S	High
Accord Brook	3206000-02S	High
Fulling Mill Collection Basins	3206000-03S	High

The wells for the Hingham/Hull water supply are located within a single water supply protection area, with a portion extending into the Town of Norwell. Each well has a Zone I radius of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barrier (i.e. confining clay layer) that can prevent contaminant migration. Please refer to the attached map of the Zone II.

The reservoirs for Hingham and Hull are located within three separate water supply protection areas, with a portion of the Accord Pond water supply protection area extending into the towns of Norwell and Holbrook, and a portion of the Accord Brook water supply protection area extending into the town of Norwell.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

Section 2: Land Uses in the Protection Areas

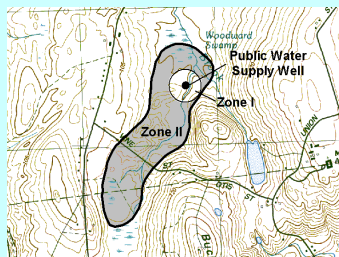
The Zone II and Zone Cs for Hingham and Hull's sources are primarily a mixture of forest, residential, and wetlands, and open land, with a small portion consisting of commercial and waste disposal land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Activities in Zone A
3. Hazardous Materials Storage and Use
4. Transportation Corridor
5. Residential Land Uses
6. Oil or Hazardous Material Contamination Sites
7. Comprehensive Wellhead Protection Planning

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



The ranking of susceptibility to contamination for the Zone II of the Free St. Well #1, Free St. Well #2, Scotland St. Well, Downing St. Well, Free St. Well #3, and Prospect Well is high, based on the presence of at least one high threat land use within the water supply protection area, as seen in Table 2; the ranking of susceptibility to contamination for Accord Pond, Accord Brook, and Fulling Mill Collection Basin Zone Cs is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone I – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells:

Free Street Well #1 - There are several homes served by on-site septic systems in the Zone I.

Free Street Well #2 - There is one home served by an on-site septic system in the Zone I.

Free Street Well #3 - There are four homes served by on-site septic systems, and local roads in the Zone I.

Scotland Street Well - There is one home served by an on-site septic system and local roads in the Zone I.

Downing Street Well - There are recreational activities occurring in the Zone I.

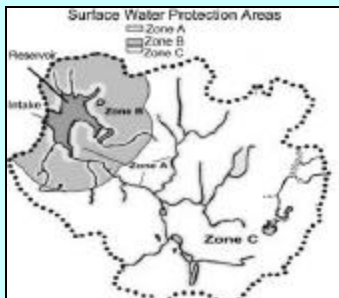
Prospect Well - There are four homes served by an on-site septic system, and local roads in the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Agreement Options - Until land is available, attempt to obtain a *Memorandum of Understanding* and *Right of First Refusal*.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners into the septic system, and that the system will be pumped at a specific frequency. The application of lawn care chemicals could also be restricted. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU.

Right of First Refusal is a legal document that gives the water supplier first chance to purchase land when it becomes available. See *Right of First Refusal* in Appendices.

2. Activities in Zone A - Existing and future land use activities which may have an impact on surface water sources include: public and private recreational activities; untreated stormwater runoff; domestic animals; new construction; spills along roads; above ground and underground storage tanks; erosion; and unpermitted and unauthorized activities. Wild animals and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. The following activities occur in the Zone A of the system's reservoirs:

Accord Pond - There are numerous homes throughout the Zone A of the reservoir and its tributary, some of which are served by on-site septic systems;

local roads run throughout the Zone A of the reservoir and its tributaries, with a portion of Route 3 crossing a small section of a tributary; numerous commercial activities occur throughout the reservoir's Zone A and its tributary, some of which have underground storage tanks.

Accord Brook - There are numerous homes throughout the Zone A, some of which are served by on-site septic systems; local roads cross Accord Brook in several locations, with Route 53 crossing near the intake of Accord Pond.

Zone A Recommendations:

- ✓ To the extent possible, remove all activities from the Zone As to comply with DEP's Zone A requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ Keep any new prohibited activities out of the Zone A.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Hazardous Materials Storage and Use – Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

4. Transportation Corridors - Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II and Zone Cs.

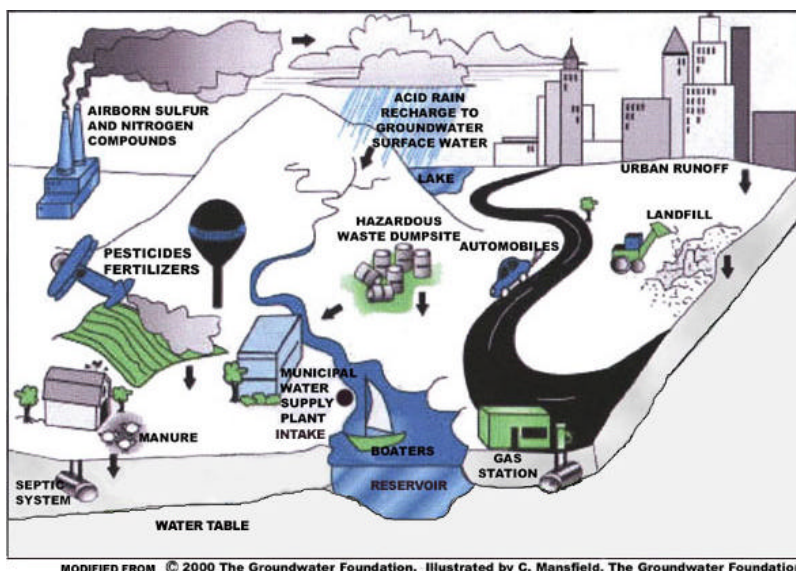


Figure 1: Sample watershed with examples of potential sources of contamination

- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with Town and State emergency response teams to ensure that any spills within the Zone II, Zone A and Zone C can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with city officials to investigate mapping options such as those in the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II Number	Zone C Source ID	Potential Contaminant Sources*
Commercial					
Gas Stations	2	H	394		Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	12	H	394	01S, 03S	Spills, leaks, or improper handling of automotive fluids, and solvents
Bus and Truck Terminals	2	H	394	03S	Spills, leaks, or improper handling of fuels and maintenance chemicals
Cemeteries	3	M	394	03S	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids (such as arsenic)
Dry Cleaners	3	H	394	01S, 03S	Spills, leaks, or improper handling of solvents and wastes
Medical Facilities	1	M	394		Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes
Paint Shops	2	H	394	03S	Spills, leaks, or improper handling or storage of paints, solvents, other chemicals
Repair Shops (Engine, Appliances, Etc.)	3	H	394	03S	Spills, leaks, or improper handling or storage of engine fluids, lubricants, and solvents
Residential					
Fuel Oil Storage (at residences)	Numerous	M	394	01S, 02S, 03S	Spills, leaks, or improper handling of fuel oil
Lawn Care/ Gardening	Numerous	M	394	01S, 02S, 03S	Over-application or improper storage and disposal of pesticides
Septic Systems/ Cesspools	Numerous	M	394	01S, 02S, 03S	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous					
Large Quantity Hazardous Waste Generators	1	H	394	02S	Spills, leaks, or improper handling or storage of hazardous materials and waste

Land Uses	Quantity	Threat	Zone II Number	Zone C Source ID	Potential Contaminant Sources*
Oil or Hazardous Material Sites	2	--	394	02S	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	5	M	394	03S	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small quantity hazardous waste generators	5	M	394	01S, 02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	Numerous/ several	L	394	01S, 02S, 03S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	6	M	394	01S, 03S	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	26	H	394	02S	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generator	8	L	394	01S, 02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Wastewater Treatment Plant/ Collection Facility/ Lagoon	7	M	394	01S, 03S	Improper handling or storage of treatment chemicals or equipment maintenance materials; improper management of wastewater

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

5. Residential Land Uses – Approximately 35% of the combined Zone II and Zone Cs consist of residential areas. A portion of the Zone II for the wellfield is served by municipal sewerage, with the remaining homes having on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

6. Presence of Oil or Hazardous Material Contamination Sites – The Zone II and Zone Cs contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the maps as Release Tracking Numbers 4-0000134, and 4-0015314. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

7. Protection Planning – Currently, the Town of Hingham does not have water supply protection controls. Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. A Water Resource Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Top 5 Reasons to Develop a Local Wellhead and Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - Increased monitoring and treatment
 - Water supply clean up and remediation
 - Replacing a water supply
 - Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Protection Planning Recommendations:

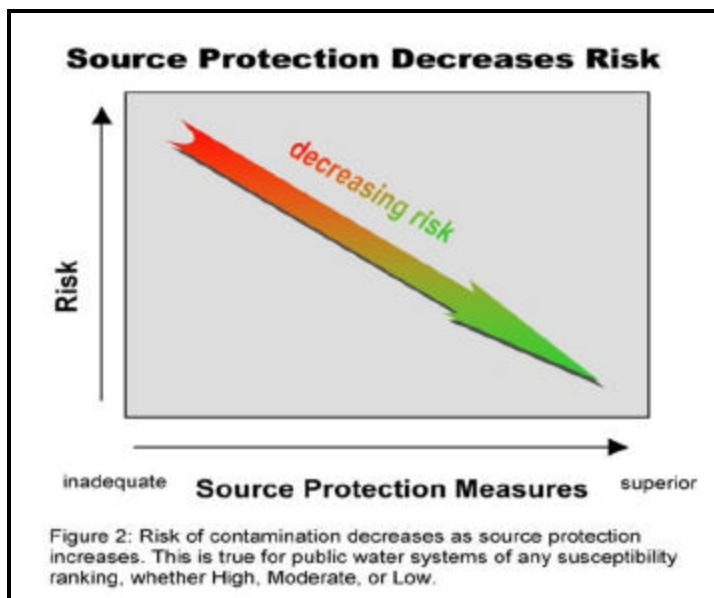
- ✓ Develop a Wellhead and Surface Water Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan” and “Developing A Local Surface Water Supply Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead and surface water protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2) and Surface Water Supply Protection Regulations 310 CMR 22.20B and 310 CMR 22.20C. If there are no local controls or they do not meet the current regulations,

adopt controls that meet 310 CMR 22.21(2), 310 CMR 22.20B and 310 CMR 22.20C. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

Other land uses and activities within the Zone I and Zone Cs that are potential sources of contamination are included in Table 2. Refer to Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination.



Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system's Zone II and Zone Cs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Having an Emergency Response Plan that deals with spills or other emergencies
- Working with Conservation Commission, Board of Health, Selectmen, and other local officials on source protection issues

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I and Zone A regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and Zone C and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead and Surface Water Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	NO	To the extent possible, remove prohibited activities in Zone A to comply with DEP's Zone I and Zone A requirements. Investigate options for gaining ownership or control of the Zone A.
Are the Zone I and Zone A posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone I and Zone A regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I and Zone A?	NO	Monitor prohibited activities in Zone A, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2)?	UNKNOWN	Work with the Planning Board and the Selectmen to develop bylaws that meet land use controls required by 310 CMR 22.21(2) and 310 CMR 22.20B & C. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	UNKNOWN	Request that municipal officials in Rockland and Norwell develop land use restrictions that meet 310 CMR 22.21(2) and 310 CMR 22.20C, and to incorporate Hingham's source protection areas.
Planning		
Does the PWS have a local surface water and wellhead protection plan?	NO	Develop a wellhead and surface water supply protection plan to include all sources. Follow "Developing a Local Wellhead Protection Plan" and "Developing a Local Surface Water Supply Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	NO	A committee exists for the Weir River Watershed. To have a well rounded committee, include representatives from local government, citizens' groups, neighboring communities, and the business community, and expand interests to all sources.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Floor drain inspection was conducted in conjunction with DEP. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	SOME	Currently, the outreach is through the annual Consumer Confidence Report, and through the water department website. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II and Zone C.

Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, town boards, and the local media.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

APPENDIX A: DEP PERMITTED FACILITIES WITHIN HINGHAM/HULL WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
136527	CUMBERLAND GULF #200102	19 WHITING STREET	HINGHAM	FUEL DISPENSER	FUEL DISPENSER
37161	FIRESTONE STORE	22 WHITING STREET	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
312084	FRIDAY GRAPHICS	49 WHITING STREET	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
209230	GETTY 30375	4 WHITING ROAD	HINGHAM	FUEL DISPENSER	FUEL DISPENSER
32666	HINGHAM MUNICIPAL LIGHT	308 CUSHING STREET	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
323110	7 ELEVEN 32493	95 WASHINGTON STREET	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
323110	7 ELEVEN 32493	95 WASHINGTON STREET	NORWELL	FUEL DISPENSER	FUEL DISPENSER
364940	ALLEGRA PRINT & IMAGING	77 ACCORD PARK DRIVE	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
35008	AUTOMOTIVE HARD PARTS	9 GROVE STREET	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
33605	FABRIC CARE HOUSE	62 POND STREET	NORWELL	HANDLER	SMALL QUANTITY GENERATOR
134271	JIFFY LUBE	49 WASHINGTON STREET	NORWELL	HANDLER	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
134271	JIFFY LUBE	49 WASHINGTON STREET	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
178008	MOBIL OIL CORP SS QLW	89 WASHINGTON & GROVE STREETS	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
178008	MOBIL OIL CORP SS QLW	89 WASHINGTON & GROVE STREETS	NORWELL	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
357758	NORWELL MOBIL	89 WASHINGTON STREET	NORWELL	FUEL DISPENSER	FUEL DISPENSER

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
359392	PLANET SUBARU	22 POND STREET	NORWELL	HANDLER	LARGE QUANTITY GENERATOR
31954	QUEEN ANNES SHELL	10 WASHINGTON STREET	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
31954	QUEEN ANNES SHELL	10 WASHINGTON STREET	NORWELL	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
29670	RIETZL CORP	59 POND STREET	NORWELL	APPR	INDUSTRIAL WASTE WATER HOLDING TANK
36464	SEARS ROEBUCK & CO	ACCORD PARK DRIVE	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
325669	SHELL 137821	10 WASHINGTON STREET	NORWELL	FUEL DISPENSER	FUEL DISPENSER
293551	SOUTH SHORE IMPORTED CARS INC	75 POND STREET	NORWELL	APPR	INDUSTRIAL WASTE WATER HOLDING TANK
34745	SULLIVAN TIRE	QUEEN ANNES CORNER	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
38141	SUN REFINING & MARKETING CO	117 POND STREET	NORWELL	HANDLER	VERY SMALL QUANTITY GENERATOR
38141	SUNOCO #0012-3653	117 POND STREET	NORWELL	FUEL DISPENSER	FUEL DISPENSER

UNDERGROUND STORAGE TANKS WITHIN HINGHAM/HULL WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
CUMBERLAND GULF	19 WHITING STREET	HINGHAM	GAS STATION	10000	GASOLINE
CUMBERLAND GULF	19 WHITING STREET	HINGHAM	GAS STATION	10000	GASOLINE
CUMBERLAND GULF	19 WHITING STREET	HINGHAM	GAS STATION	10000	GASOLINE
CHRISTY'S	95 WASHINGTON STREET	NORWELL	GAS STATION	6000	GASOLINE
CHRISTY'S	95 WASHINGTON STREET	NORWELL	GAS STATION	6000	GASOLINE
CHRISTY'S	95 WASHINGTON STREET	NORWELL	GAS STATION	6000	GASOLINE
GETTY STATION	4 WHITING STREET/ POND STREET	NORWELL	GAS STATION	10000	GASOLINE
GETTY STATION	4 WHITING STREET/ POND STREET	NORWELL	GAS STATION	8000	GASOLINE
GETTY STATION	4 WHITING STREET/ POND STREET	NORWELL	GAS STATION	6000	GASOLINE
GETTY STATION	4 WHITING STREET/ POND STREET	NORWELL	GAS STATION	510	WASTE OIL
GOODYEAR ASSOCIATION	POND STREET & WASHINGTON STREET	NORWELL	AUTO REPAIR	500	WASTE OIL
MOBIL	85 WASHINGTON STREET	NORWELL	GAS STATION	10000	GASOLINE
MOBIL	85 WASHINGTON STREET	NORWELL	GAS STATION	10000	GASOLINE
MOBIL	85 WASHINGTON STREET	NORWELL	GAS STATION	10000	GASOLINE
MOBIL	85 WASHINGTON STREET	NORWELL	GAS STATION	10000	GASOLINE
MOBIL	85 WASHINGTON STREET	NORWELL	GAS STATION	1000	WASTE OIL

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
SHELL SERVICE STATION	10 WASHINGTON STREET	NORWELL	GAS STATION	12000	GASOLINE
SHELL SERVICE STATION	10 WASHINGTON STREET	NORWELL	GAS STATION	12000	GASOLINE
SHELL SERVICE STATION	10 WASHINGTON STREET	NORWELL	GAS STATION	12000	GASOLINE
SHELL SERVICE STATION	10 WASHINGTON STREET	NORWELL	GAS STATION	500	FUEL OIL
SUNOCO	117 POND STREET	NORWELL	GAS STATION	8000	GASOLINE
SUNOCO	117 POND STREET	NORWELL	GAS STATION	8000	GASOLINE
SUNOCO	117 POND STREET	NORWELL	GAS STATION	8000	GASOLINE
SUNOCO	117 POND STREET	NORWELL	GAS STATION	1000	WASTE OIL
SUNOCO	117 POND STREET	NORWELL	GAS STATION	550	FUEL OIL
SUNOCO	117 POND STREET	NORWELL	GAS STATION	550	WASTE OIL

For more information on underground storage tanks, visit the Massachusetts department of fire services web site: <http://www.state.ma.us/dfs/ust/usthome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities located within the water supply protection area(s) should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Hingham/Hull’s Water Supply Protection Areas

DEP’s datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP’s Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP’s Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state’s OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN).

RTN	Release Site Address	Town	Contaminant Type
4-0000134	Route 228 & 53	Norwell	Oil
4-0015314	86 High Street	Norwell	Oil

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Kingston Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Kingston Water Department
<i>PWS Address</i>	Elm Street
<i>City/Town</i>	Kingston, MA 02346
<i>PWS ID Number</i>	4145000
<i>Local Contact</i>	Matthew Darsch
<i>Phone Number</i>	(781) 585-0504

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

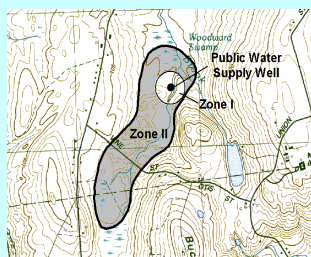
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

IWPA

Susceptibility: High

Well Names	Source IDs
Soules Pond Tubular Wellfield (inactive)	41450000-01G

Zone II #: 39

Susceptibility: High

Well Names	Source IDs
Grassy Hole GP Well	41450000-06G

Zone II #: 40

Susceptibility: High

Well Names	Source IDs
Soules Pond GP Well	41450000-02G
South St. GP Well	41450000-03G
Millage Rd. GP Well	41450000-05G

Zone II #: 41

Susceptibility: High

Well Names	Source IDs
Winthrop St. Well #3 (inactive)	41450000-04G

Zone II #: 326

Susceptibility: High

Well Names	Source IDs
Trackle Pond Well	41450000-07G

The wells for the Kingston Water Department are located in four Zone II and an IWPA. The Soules Pond tubular wellfield (01G) and Winthrop St. Well #3 (04G) have been inactive for longer than five years and would need to go through the DEP New Source Approval process, which would include assessment of potential sources of contamination, prior to reactivation. The wellfield Zone I is a 250 foot radius around each wellpoint, effectively a 250 foot radius around the perimeter of the wellfield. Each of the other wells has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I, IWPA, and Zone II.

Water from the wells is pH adjusted for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and IWPA for the Kingston Water Department are a mixture of residential, commercial, and forested land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead, other than well 01G, for which the Zone I is essentially a 250 foot buffer from the perimeter of the wellfield. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The twelve (12) Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: 4145000-03G - The Zone I includes 3 homes with 2 septic systems and parking areas.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

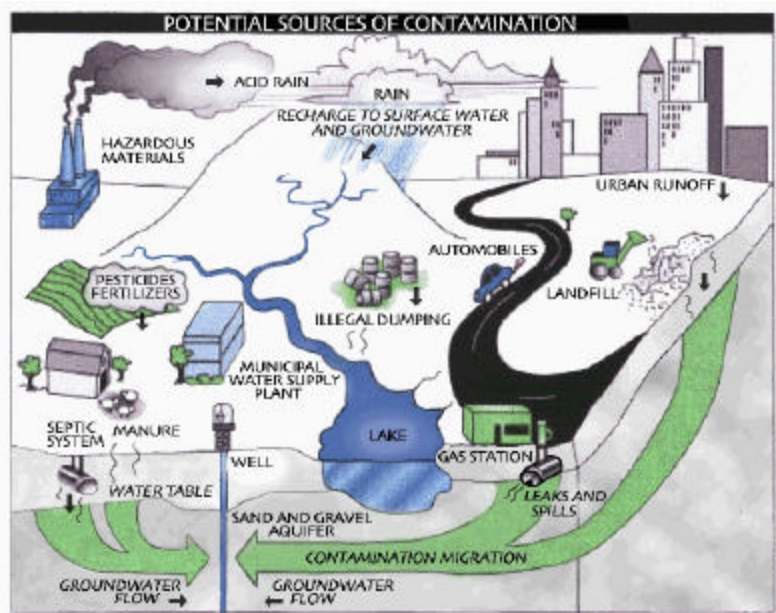
2. Residential Land Uses – Areas of the Zone II and IWPA consist of residential areas. Only a small percentage of the areas have public sewers, and so most use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 3, Route 44, and Route 80 run through the protection areas. Local roads are common throughout the Zone II and IWPA. Roadway construction, maintenance, and typical highway use can all be

potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

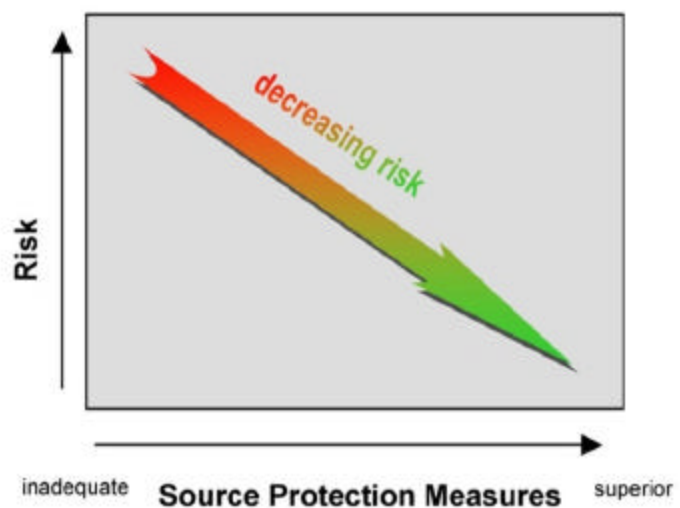


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	several	M	All	Fertilizers: leaks, spills, improper handling, or over-application
Nurseries	2	M	#40, #41, IWPA	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	several	H	All	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Gas Stations/ Service Stations	2	H	#41	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Golf Courses	1	M	#40, IWPA	Fertilizers or pesticides: over-application or improper handling
Medical Facilities	1	M	#41	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	M	#39, #40	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	#40	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage

Table 2 continued on page 6.

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Table 2 Continued: Land Use in the Protection Areas (Zones I and II) - continued

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	100+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	100+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	100+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Few	H	All	Microbial contaminants
Fishing/Boating	Few	M	All	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	#41	Seepage of leachate
Oil or Hazardous Material Sites	1	--	#40	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	1	M	#326	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	H	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	H	#39, #326	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	3	H	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

(Continued from page 4)

the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – Areas within the Zone II re commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II #40 contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40014144. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are several cranberry bogs within the Zone II and IWPA. As is the case for most other crops, the commercial production of cranberries usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses and follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Update and implement your Wellhead Protection Plan as needed. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not cover all Zone II areas or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	SOME	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	NO	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	SOME	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with Duxbury and Plymouth to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update and implement a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, agricultural and residential uses within the Zone II.

(Continued from page 7)

Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include gas stations, sand and gravel mining, and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Update and implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
26409	Southeastern Concrete	Off Elm St	Kingston	Generator of Hazardous Waste	Very Small Quantity Generator
33034	The Clothes Clinic	Kingsbury Sq Plz	Kingston	Generator of Hazardous Waste	Very Small Quantity Generator
54411	SE Concrete Inc	Elm St	Kingston	Plant	Air Quality Permit
245890	Summer Hill Ltd Partnership	Summer Hill Shopping Plaza	Kingston	Solid Waste Landfill	Closed Landfill
272755	Independence Mall	Independence Mall Way	Kingston	Groundwater Discharge	Major Discharge
364418	Tosco Corp	183 Summer St	Kingston	Generator of Hazardous Waste	Very Small Quantity Generator
373330	Southeastern Concrete Inc	399 Elm St	Kingston	Large Quantity Toxics User	Large Quantity Toxics User
376542	Conocophillips Exxon 2634805	183 Summer St	Kingston	Fuel Dispenser	Fuel Dispenser

APPENDIX A (continued):
REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Hess 21321	165 Summer St	Kingston	Gas Station	2 Wall	Interstitial Space Monitor	12000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline
Tosco Exxon #2634805	183 Summer St	Kingston	Gas Station	1 Wall	Approved In-Tank Monitor	8000	Gasoline
				1 Wall	Approved In-Tank Monitor	8000	Gasoline
				1 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	-	85	Waste Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000947	183 SUMMER ST	KINGSTON	Oil
4-0014144	47 ROUND HILL RD	KINGSTON	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Sacred Heart High School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
August 25, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Sacred Heart High School
PWS Address	399 Bishops Highway- Route 80
City/Town	Kingston, Massachusetts 02364
PWS ID Number	4145001
Local Contact	John Driscoll
Phone Number	(781) 585-7511

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4145001-01G	204	511	High
Well #2	4145001-02G	204	511	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Both wells for Sacred Heart High School are located just to the northwest of the main school building. Each well has a Zone I of 204 feet and an Interim Wellhead Protection Area (IWPA) of 511 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map showing the location of the wells and boundaries of the Zone Is and IWPAs.

The water from the wells is treated with calcite to adjust its pH for corrosion control purposes. The DEP requires public water suppliers to monitor the quality of the water.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for more information. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Underground Storage Tank (UST) With Heating Oil; and**
3. **Stormwater Catchbasin.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains school buildings, athletic fields, roads, parking areas, and recreational activities. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct stormwater away from the Zone Is.

2. **Underground Storage Tank (UST)**- A UST with fuel oil is located within the protection area of the water supply. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone Is	IWPAs	Threat	Comments
Fuel Storage Below Ground	No	Yes	High	Heating oil tank
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Field	Yes	Yes	Moderate	Fertilizer and pesticide use
Stormwater Drains	Yes	Yes	Moderate	Contaminated runoff from roads and parking.
Structures	Yes	Yes	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

local fire department for any additional local code requirements regarding USTs.

- ✓ The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks (refer to attachments).
- ✓ During refilling of UST, ensure that the operator of the oil transport tanker does not leave the vehicle area while the UST is being filled.

3. **Storm Water Catch Basins** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

4. **Athletic fields** – There are athletic fields within the Zone I and IWPA. Fertilizers and pesticides are applied to the lawn that lies within the protection area. Fertilizers and pesticides, if improperly applied or stored, can be potential sources of contamination to the water supply.

Recommendations:

- ✓ Instruct the groundskeepers never to use fertilizers or pesticides within the Zone I.
- ✓ Use best management practices when applying fertilizers or pesticides within the IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Sacred Heart High School is commended for

fencing, covering and marking the wellheads so students and others know where the wells are. Sacred Heart High School should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Ensure the Underground Storage Tank meets all current standards or consider replacement with a properly contained above ground storage tank.

Zone I:

- ✓ Keep new non-water supply activities out of the Zone I.
- ✓ When feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any tanks for leaks,

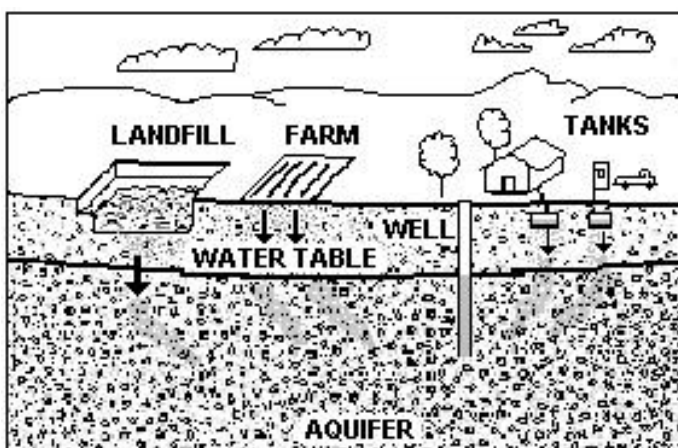


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Southeast Regional Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

etc.

- ✓ Use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Use propane or natural gas for back-up power sources.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers and certified operator.
- ✓ Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Bring any floor drains into compliance with DEP Regulations (refer to attachment "Industrial Floor Drain Brochure").
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your status and regulatory requirements.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer

Protection District Bylaws and to assist you in improving protection.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under

the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Sacred Heart Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 16, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Sacred Heart Elementary School
PWS Address	329 Bishops Highway-Rte. 80
City/Town	Kingston, Massachusetts
PWS ID Number	4145003
Local Contact	Ron Maurice, Certified Operator
Phone Number	781 585-2114

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4145003-01G	153	450	High
Well #2	4145003-02G	153	450	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Sacred Heart Elementary School is a public water supply currently serving 450 elementary students and an on-site convent. Well #1 and Well #2 are located in a vault adjacent to the southeast corner of the school building. The two (2) wells are manifolded and operate on an alternating basis. Well #1 is an 8-inch 90-foot deep well and Well #2 is believed to have been completed at the same depth. Based on the current Zone I of 153 feet and the Interim Wellhead Protection Area (IWPA) of 450 feet, the average daily withdrawal for the well is limited to 2257 gallons per day. The Zone I and IWPA protective radii are based on metered water readings. Please refer to the attached map of Zone I and IWPA. Well #1 is located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminate migration. A diesel-powered generator provides emergency

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

power.

Both wells serving Sacred Heart Elementary School are treated for corrosion control with a treatment system that consists of multimedia filters and two (2) acid neutralization units. An irrigation well for the athletic fields is located in the southwest corner of the soccer field. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is,**
2. **Underground Storage Tank (UST) in IWPA,**
3. **Athletic Fields,**
4. **Floor Drain,**
5. **Septic System.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the Zone I, as seen in Table 2.

1. **Zone Is** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Zone I for both wells contains school buildings, pavement, lawn areas, catch basins and an aboveground storage tank containing diesel fuel that has 110 percent containment. The School does not use fertilizer or pesticides in the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Examples of modification or expansion include the addition of buildings, temporary or permanent, and increased water use due to an increase of staff and students.

Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ If the school intends to continue using the structures, driveways, and paved areas in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Underground Storage Tank	No	Well #1, #2	High	7600 gallon heating fuel tank, no secondary containment, or leak detection
Floor Drain	No	Well #1, #2	High	Basement boiler room
Aboveground Storage Tank	No	Well #1, #2	Moderate	Diesel fuel tank with secondary containment
Hazardous Material/Waste Oil storage, handling and use	No	Well #1	Moderate	Waste oil and small amounts of chemical storage
Athletic Fields and landscaped areas	Well #1, #2	Well #1, #2	Moderate	
Pavement (storm water runoff)	Well #1, #2	Well #1, #2	Moderate	Provide drainage away from the wells
Septic System	No	Well #1	Low	Refer to attachment on septic systems

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- V During the SWAP assessment visit, the Department recommended that the UST for the diesel fuel be removed.

Recommendation implemented

Subsequently, the certified operator indicated that the underground storage tank for the diesel generator had been removed and replaced with an aboveground storage tank with 110 percent secondary containment.

2. **Underground Storage Tank** - Within the IWPA, a 7600-gallon UST containing heating fuel is located approximately 210 feet west of both wells. According to school staff the tank is believed to been installed over 30 years ago. The UST has overfill protection and undergoes tightness testing periodically. If managed improperly, USTs can be potential sources of contamination due to leaks or spills of the chemicals they store. According to 527 CMR 9.00 storage tanks that do not have an acceptable form of leak protection or cathodic protection shall have the tank tested at the owners expense.

Recommendation:

- V Consult with the local fire department for specific code requirements regarding your USTs. Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements.
- V For consumptive fuel USTs in the IWPA, the Drinking water program recommends the following hierarchy:
 - I. If feasible, upgrade to propane or natural gas and remove UST.
 - II. Replace UST with an aboveground storage tank (AST) in the IWPA with 110% secondary containment.
 - III. Replace UST with a new UST meeting all current regulatory requirements (e.g. double walled, leak protection etc.) in the IWPA.

Recommendation to be implemented: The certified operator indicated that the heating fuel UST would be removed and replaced with an AST with secondary containment within the next year.

3. **Athletic Fields** - There are athletic fields located within the IWPA of Well #1 and Well #2. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply. Currently, the school does not use fertilizer or pesticides on the athletic fields.

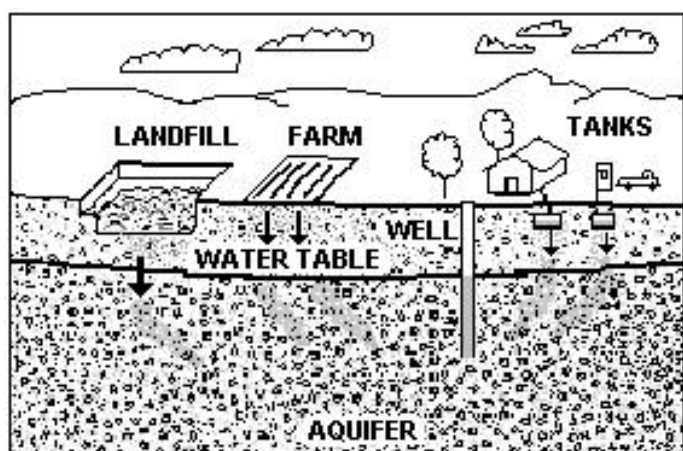


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Recommendations:

- V If the school decides to use fertilizer or pesticides use BMPs for applying, handling and storing.
- V Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

4. **Floor Drain** - A floor drain was observed within the basement boiler room. The boiler treatment chemicals have been removed from the boiler room. The backwash from the corrosion control treatment system discharges to the septic system. Additionally, there is a sump pump located in the basement to prevent flooding.

Recommendation:

- V Backwash of water treatment devices to a septic system regulated under 310 CMR 15.000 is prohibited. Contact your local Board of Health for additional information regarding your requirements under 310 CMR 15. 000.
- V Industrial Wastewater- Discharge from the boiler blow

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

down is required to go to a tight tank or sewer. Please contact Jeff Gould in the Department's Water Pollution Control section at 508-946-2757 in order to discuss your management options.

5. **Septic System** - The septic system leaching field is located approximately 300 feet west of both wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals (include custodial staff, groundskeepers, and certified operator).
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Other activities noted during the assessment

A garage is located within the western portion of the IWPA. The garage contained gasoline containers, fertilizer and pesticides and other small amounts of petroleum products, cleaners etc. The oil/hazardous material storage poses a potential threat to the well due to its proximity and potential for accidental release. Provide containment and exercise caution when using and storing these products. Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html. Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

Storm water for the western parking lot is routed by catch basins and overland flow to a retention basin, which is inside the IWPA, approximately 425 feet west of the wells. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Sacred Heart Elementary School is commended for its removal of the UST for the diesel generator. Sacred Heart Elementary School should review and adopt the **key recommendations above** and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Well #1 and Well #2 are vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18 inches above the final grade of the surface as part of future modifications to both wells.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff from local roads is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.

Planning:

- ✓ Work with local officials in Kingston to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4 Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide and Fertilizer Use Fact sheets
- Healthy Schools Fact Sheets
- Heating Oil Delivery Lines, A Homeowner's Guide to Preventing Leaks
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Assawompsett Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
August 8, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Assawompsett Elementary School
PWS Address	232 Main Street
City/Town	Lakeville, Massachusetts
PWS ID Number	4146007
Local Contact	Richard Vigers
Phone Number	(508) 947-1403

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4146007-01G	217	534	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Assawompsett Elementary School is a public water supply currently serving a population of 700 students in preschool through grade four. Well #1 serves the 80,000 square feet Assawompsett Elementary School. Well #1 is a gravel packed well drilled to a total depth of 57 feet located in a well house approximately 20 feet north of Assawompsett pond. The well house is partially situated below ground with evidence of previous flooding in the vault. The average daily withdrawal for the well is limited to 6040 gallons per day based on a Zone I of 217 feet and Interim Wellhead Protection Area (IWPA) of 534 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the school has sodium hypochlorite added as a disinfectant due to the detection of total coliform bacteria for the third-quarter 2000 and October 2000. Additionally, a Culligan automatic water softer system is in place to reduce hardness (as expressed as CaCO_3) caused by calcium and magnesium in groundwater. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is, and**
2. **Floor Drain,**
3. **Stormwater Catchbasins,**
4. **Underground Storage Tank,**
5. **Septic System.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains school parking areas and school lawn. The Zone I is comprised mainly of the pond, and a wooded area. The public water supplier does not own and/or control all land encompassed by the Zone I. The well is located on land owned by the City of Taunton associated with source protection of Assawompsett pond, a surface water supply for the City of Taunton. Drinking water signs were not posted on the school property at the time of the SWAP site visit. School staff indicated the signs had recently been stolen. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Below Ground	No	Well #1	High	10,000 gallons UST with No. 2 oil, double walled with leak detection and overfill protection
Floor Drain	No	Well #1	High	Refer to industrial floor drain brochure in the attachments
Storage, use, and handling of hazardous materials	No	Well #1	Moderate	Small quantities of cleaning supplies, gasoline, etc.
Parking lot, driveways & roads	Well # 1	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Fields, playgrounds	No	Well #1	Moderate	Fertilizer and pesticide use
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the attachments
Structures	No	Well #1	-	Non-water supply structures in IWPA

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Well #1 is a vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. In a July 30, 2001 sanitary survey letter, the Department required that the pit installation be abandoned and the well casing be raised to 18 inches above the final grade of the ground surface.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. **Floor Drain** - A floor drain was observed within the school building within a room containing the water softening treatment equipment. The backwash from the water softening treatment system discharges to the floor drain. The ultimate discharge location for this floor drain is unknown

Recommendation:

- ✓ Determine the discharge point of the floor drain.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Bring the floor drain into compliance with DEP's Regulations (refer to attachment 4 - Industrial Floor Drain Brochure).
- ✓ Backwash of water purification or filtration devices to a septic system regulated under 310 CMR 15.000 is prohibited. Contact your local Board of Health for additional information regarding your requirements under 310 CMR 15.000.
- ✓ If the discharge point of the floor drain is determined to be a dry well, register the dry well through the Underground Injection Control (UIC) program (BRP WS 06 permit application). Contact the UIC coordinator for the Southeast Region Office of the Department if you require additional technical assistance (Mark Dakers Tele. #508-946-2847).

3. **Septic systems** - The septic system tanks and leaching field are located approximately 500 feet north of Well #1. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

4. **Underground Storage Tank (UST)** - A double walled 10,000 gallon #2 fuel UST with leak detection is located approximately 500 feet north of Well #1. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local

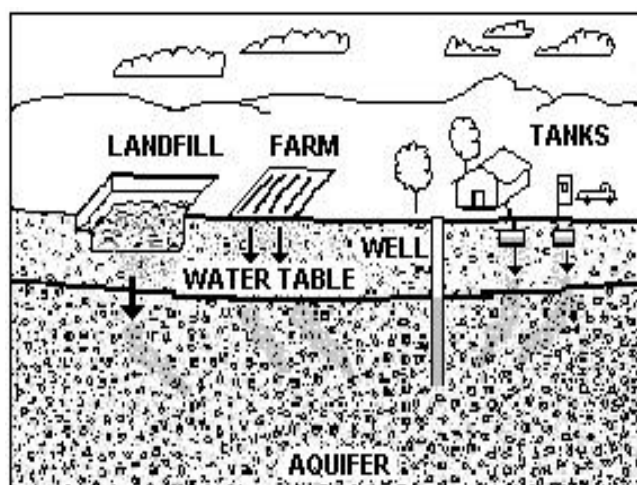


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

Training and Education:

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- V Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

fire department for any additional local code requirements regarding USTs.

- V During refilling of UST, ensure that the operator of the oil transport tanker does not leave the vehicle while the UST is being filled.
- V Ensure that the delivery operator has determined the tanks available oil capacity to prevent overfilling (refer to 527 CMR 8.00).

- 5. Storm Water Catch Basins** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- V Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Other activities noted during the assessment:

There is one transformer located approximately 550 feet north of Well #1. All electrical transformers contain oil and depending on the age of the transformer, the oil may contain PCBs. For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement.

The school has a backup diesel generator that it is insufficient to power Well #1. The Department recommends that any upgrade for backup power sources use propane or natural gas.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Assawompsett Elementary School should review and adopt the **key recommendations above** and the following:

Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Prohibit public access to the well and pump house by locking facilities, and posting signs.
- V Conduct regular inspections of the Zone I. Look for illegal dumping, and evidence of vandalism.
- V Redirect road and parking lot drainage in the Zone I away from well.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- ✓ Work with local officials in Lakeville to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Fertilizer Use Fact sheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- UIC Registration Package
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Freetown/Lakeville Regional School District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
April 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Freetown/Lakeville Regional School District
PWS Address	100 Howland Road
City/Town	Lakeville, MA 02347
PWS ID Number	4146016
Local Contact	Robert Souza
Phone Number	(508) 947-0530

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	398	2560	high
Well #2	02G	398	2560	high

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

The Freetown/Lakeville Regional School District receives its drinking water from two bedrock wells, Well #1 is located within the school building complex and Well #2 is located adjacent to the school. Well #1 has a Zone I of 398 feet and an Interim Wellhead Protection Area (IWPA) of 2560 feet. Well #2 also has a Zone I of 398 feet and an IWPA of 2560 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Zone I and IWPA.

The wells serving the facility have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **underground Storage Tank;**
3. **athletic fields;**
4. **vehicle parking and local roads; and**
5. **residential development.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence at least one high threat within the Zone I and IWPA.

1. **Zone Is** – Currently, the wells do not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I contains part of the school building, underground storage of heating fuel, access roads and vehicle parking. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct stormwater drainage outside of Zone I.
- ✓ Do not allow new non water supply activities within the Zone I.
- ✓ Ensure that all floordrains within the School meet Underground Injection Control Regulations 310 CMR 27.00.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
underground storage tank	Yes	Yes	High	leaks and spills of contents
school	Yes	Yes	Moderate	solvents & other materials used in classrooms
parking lot	Yes	Yes	Moderate	stormwater runoff, spills
lawn/playing fields	No	Yes	Moderate	fertilizer and pesticide use
residential development	No	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks
roads	No	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ Ensure that all laboratory wastes are disposed of properly.

1. **Underground Storage Tank (UST)**- An underground storage tank with fuel oil is located within the Zone I of the water supply. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks.
- ✓ During refilling of UST, ensure that the operator of the oil transport tanker does not leave the vehicle area while the UST is being filled.

2. **Athletic fields** – There are several athletic fields within the IWPA of the wells. Improper fertilizer and pesticide use is a potential contamination source for ground water wells

Recommendation:

- ✓ Use BMPs for applying, handling, and storing pesticides and fertilizers.
- ✓ Develop an integrated Pest Management (IPM) plan to reduce fertilizer and pesticide use. Visit <http://www.state.ma.us/dfa/cpa/ipmplan.htm> for information on developing an IPM plan.

3. **Vehicle parking and Local Roads** – School parking is within the Zone I. Local roads intersect the IWPA. Runoff and spills from vehicle parking and local roads can contaminate public drinking water wells.

Recommendation:

- ✓ Map stormwater drainage and direct drainage away from the Zone I.
- ✓ Do not use road salt in the Zone I.
- ✓ Limit use of deicing materials in IWPA.
- ✓ Continue to maintain contact with the Fire Department about spills.

4. **Residential Development** – There is residential development within the WPA.

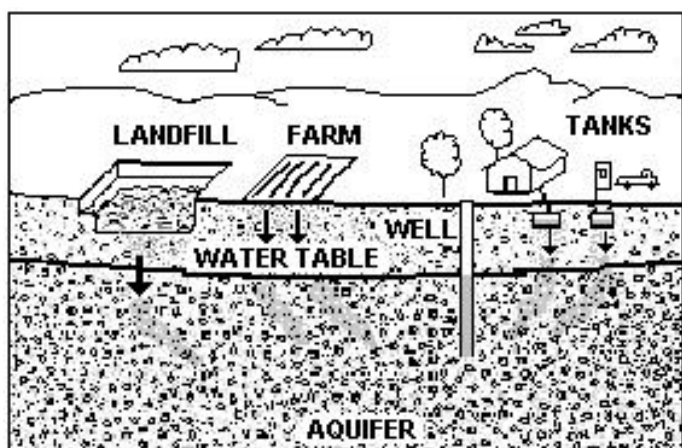


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Residential activities that pose a threat to drinking water wells include septic systems, lawn care and household hazardous materials including heating fuel storage.

Recommendation:

- ✓ Educate residents in the IWPA about water supply protection. Include material on septic system operation and maintenance, proper hazardous materials handling including heating fuel storage, and proper lawn care practices.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. School officials should review and adopt the key recommendations above and the following:

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Ensure that all floordrains within the School meet Underground Injection Control Regulations 310 CMR 27.00.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Savas Plaza

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
February 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Savas Plaza
PWS Address	330 Bedford Street
City/Town	Lakeville
PWS ID Number	4146032
Local Contact	Steven Savas/Marisa Picone-Devine
Phone Number	508-947-2434/508-888-7262

Well Name	Source ID#	Zone I (in feet)	IWPA	Source Susceptibility
Well #1	4146032-01G	155	471	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

1. Description of the Water System

Well #1 provides drinking water primarily to the employees at Savas Plaza in Lakeville. The well has a Zone I of 155 feet and an Interim Wellhead Protection Area (IWPA) of 471 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (plaza, parking)
2. Residence
3. Local Road
4. Golf Course

Table 2: Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Plaza, Parking	Yes	Yes	M	spills, contaminants in stormwater
Residential	No	Yes	M	pesticides and fertilizers from lawn care; leaks or spills of automotive fluids; stormwater; microbial contamination from septic systems
Local Roads	No	Yes	M	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way; stormwater contaminants
Golf Course	No	Yes	M	spills or over-application of pesticides or fertilizers; microbial contamination from geese

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The overall ranking of susceptibility to contamination for the well is MODERATE based on the presence of at least one MODERATE threat within the Zone I and IWPA.

1. **Zone I**– The public water system owns or controls the Zone I and conducts regular inspections. The public water system does not meet DEP's Zone I requirements because there are non-water supply activities within the Zone I (commercial plaza, parking).

Recommendations

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Do not use pesticides or fertilizers within the Zone I.
- ✓ Do not use or store de-icing materials within the Zone I.

2. **Residential** – There is one home with a septic system identified within the IWPA.

3. **Local Road** – Route 18 is located within the IWPA. Leaks and spills, vehicular accidents, and over-application or spills of pesticides are potential sources of contamination.

In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

Recommendations

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.

4. **Golf Course** – Part of a golf course lies within the IWPA.

Recommendation

- ✓ Talk with the owner/operator of the golf course about the existence of the public well at Savas Plaza and the location of the IWPA.

3. Recommendations for Protection

Implementing protection measures will reduce susceptibility to contamination.

Priority Recommendations:

Zone I

- ✓ Continue to inspect the Zone I.

Training and Education

- ✓ Educate employees on source protection measures for protecting water supplies. Describe proper use, storage and disposal of materials within the Zone I. See the enclosed *Businesses Protect Drinking Water* fact sheet.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

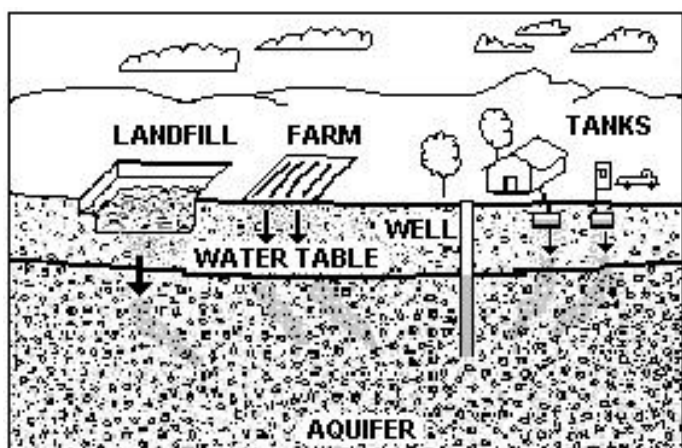


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Planning

- ✓ Work with town officials to improve water supply protection.

Funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- Businesses Protection Drinking Water fact sheet

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Blueberry Estates

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date DRAFT Prepared:
July 25, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Blueberry Estates
PWS Address	Vaughn Street
City/Town	Lakeville, Massachusetts
PWS ID Number	4146039
Local Contact	Wayne Southworth
Phone Number	(508) 238-4230

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4146039-01G	231	567	Moderate
Well No. 2	4146039-02G	231	567	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for Blueberry Estates are located on the northeast side of Vaughn Street and generally east of the main buildings. Both Well No. 1 and Well No. 2 have Zone I radii of 231 feet and Interim Wellhead Protection Area (IWPA) radii of 567 feet. The IWPAs provide interim protection areas for water supply wells when the actual recharge area has not been delineated. The actual recharge area to the wells may be significantly larger or smaller than the IWPAs. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs.

The well serving the facility has no treatment at this time. The DEP requires public water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Aboveground Storage Tanks (AST) With Heating Oil;**
3. **Private Septic Systems; and,**
4. **Athletic Fields**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains a driveway/access road to the multi-family residences. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Redirect the driveway/access road so that it no longer runs through the Zone I.
2. **Private Septic Systems** – Private septic systems are potential sources for the introduction of hazardous chemicals and microbial contaminants into the aquifer.
Recommendation:
 - ✓ Regularly schedule maintenance and inspections of the septic systems and encourage residents to properly disposal of household hazardous waste.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Driveways/road and parking areas	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
Lawn care/gardening	No	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Athletic Field	No	Yes	Moderate	Fertilizer and pesticide use

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

3. **Lawn care/gardening** – The pesticides and fertilizers used for maintaining athletic fields can be transported from the ground surface down into the aquifer with storm water and excess irrigation water. The over-application or improper storage and disposal of pesticides and fertilizers could result in contamination of the aquifer.

Recommendation:

- ✓ Inform the owners of the athletic fields that they are located in the IWPA of public water supply wells and encourage them to use proper storage, disposal, and application procedures with pesticides and fertilizers.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Blueberry Estates is commended for having a formal Emergency Response Plan to deal with spills or other emergencies. Blueberry Estates should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect the driveway/access road so that it no longer runs through the Zone I.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Redirect the driveway/access road so that it no longer runs through the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

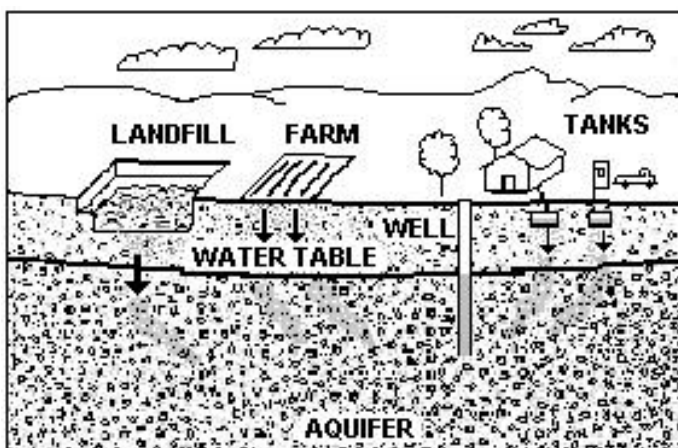


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Mullein Hill Christian Academy

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 13, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Mullein Hill Christian Academy
PWS Address	111 Highland Road
City/Town	Lakeville, Massachusetts
PWS ID Number	4146044
Local Contact	Clint Eastman, Headmaster
Phone Number	508-947-2898

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4146044-01G	136	439	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Mullein Hill Christian Academy (the "Academy") is a public water supply currently serving the 156 students. Well #1 is located in the playground approximately 140 feet north of the school. Well #1 is a 4-inch bedrock well drilled to a depth of 205 feet. Based on the current approved Zone I of 136 and the Interim Wellhead Protection Area (IWPA) of 439 feet (established in 1998 sanitary survey), the average daily withdrawal for the well is limited to 1750 gallons per day. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in a bedrock aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The water from the well serving the facility is treated at the kitchen sink with a point of use device (filter) for occasional taste problems. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate activities within the Zone I,**
2. **Athletic Fields,**
3. **Septic System,**
4. **Storm water,**
5. **Storage, Use and Handling of Hazardous Material/Oil.**

The overall ranking of susceptibility to contamination for the well is **Moderate**, based on the presence of at least one **Moderate** threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I**—Currently, the well does not meet the Department requirements that the public water supplier own or control all land encompassed by the Zone I. The Department records indicate that the eastern edge of the Zone I for the well is not owned by the Academy. The facility's Zone I contains Academy buildings, athletic fields, playgrounds and parking areas. Please note that systems not meeting Department Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Well #1 casing should be extended to 18-inches above grade in order to reduce the

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the attachments
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Fields	Well #1	Well #1	Moderate	Do not use pesticides or fertilizers in Zone I
Storage, use and handling of oil and hazardous materials	No	Well #1	Moderate	Lawn mower, gas cans, and small amounts of chemical storage
Residential	No	Well #1	Moderate	2 Residences-septic systems, heating fuel storage, lawn care
Structures	Well #1	Well #1	-	Non water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

potential for storm water infiltration into the well.

2. **Athletic Fields** - There are playing fields located within the Zone I and IWPA of Well #1. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply.

Recommendations:

- ✓ Do not apply fertilizer and pesticides within the Zone I.
- ✓ Use BMPs for applying, handling and storing of pesticides and fertilizers in the IWPA.
- ✓ Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

3. **Septic Systems** - The septic system's leaching field is located approximately 150 feet west of the well. The septic system is designed for 1800 gallons per day. However, based on the current population and using Title 5 calculation the facility is producing in excess of 2000 gallons per day. The Department issued a notice of noncompliance in 2001 requiring the Academy to reduce school population or install a new well through the Department's source approval process. If a septic system fails or is not properly maintained it is a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals or industrial wastewater to the septic system is also a potential source of contamination to the water supply.

Recommendations:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
- ✓ Educate staff on septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Workers should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>
- ✓ Monitor water usage, as exceeding the septic system design capacity could cause premature failure of the septic system.
- ✓ Continue to work the Department and Board of Health to resolve the unapproved expansion of the facility and potential overloading of the septic system.

4. **Storm water** – The Academy's paved parking areas are located west and south of the Zone I for Well #1. Storm water from the western edge of the parking lot and roof

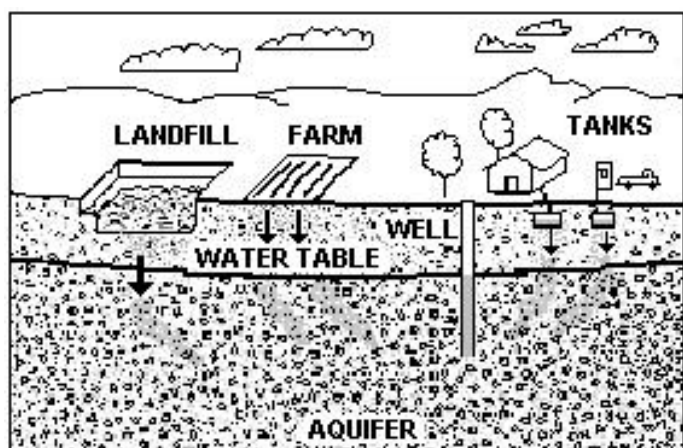


Figure 1: Example of how a well could become contaminated by different land uses and activities.

runoff discharges to a catch basin located between the school and Highland Road. Storm water is then routed from this catch basin to an underground pipe. The underground pipe daylights along the northeastern edge of the parking lot where it discharges into a 6 - inch gully located within the athletic fields. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Catch basins transport storm water from the roadway and adjacent properties to the ground.

Recommendations :

- ✓ Have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ The Department recommends the public water supplier consider nonstructural techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff. Additionally, the public water supplier

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

may want to consider structural BMPs (e.g. stormwater swales, installation of curbs along the paved areas, detention basin, etc.) as part of a comprehensive storm water management plan for the site. To learn more refer to the *Storm Water Management Handbook, Volume 1 and 2* for information on BMPs and documents available at <http://www.state.ma.us/dep/brp/wwwpubs.htm>.

- 5. Storage, Use, and Handling of Hazardous Materials/Oil:** - A storage shed containing lawn mower, gas cans and other chemical storage is located in the IWPA near the school's southern entrance on County Road. If managed improperly, household hazardous materials can all contribute to groundwater contamination. Hazardous materials may include automotive products, household cleaners paints, solvents, pesticides, and other substances. The materials within the shed pose a potential threat to the well due to their proximity and potential for accidental release.

Recommendation:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ To learn more, refer to the hazardous materials guidance documents at www.state.ma.us/dep/bwp/dhm/dhmpubs.htm and the household hazardous waste documents available at <http://www.state.ma.us/dep/recycle/hazards/hhwhdome.htm>

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Academy should review and adopt the **key recommendations above** and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- ✓ Work with local officials in Lakeville to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Agricultural:

- V Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing farm management issues.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- Pesticide and Fertilizer Use Fact sheets



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Mansfield Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Mansfield Water Department
<i>PWS Address</i>	6 Park Row
<i>City/Town</i>	Mansfield
<i>PWS ID Number</i>	4167000
<i>Local Contact</i>	Kurt Gaffney
<i>Phone Number</i>	(508) 261-7376

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 181

Susceptibility: High

Well Names	Source IDs
Cate Springs Well	4167000-01G
Prescott Well #8	4167000-09G
Prescott Well #9	4167000-10G

Zone II #: 182

Susceptibility: Moderate

Well Names	Source IDs
Dustin Well #7	4167000-08G

Zone II #: 183

Susceptibility: Moderate

Well Names	Source IDs
Albertini Well #2	4167000-03G
Albertini Well #3	4167000-04G
Albertini Well #4	4167000-05G

Zone II #: 514

Susceptibility: High

Well Names	Source IDs
Mahana Well #6	4167000-07G

Zone II #: 137

Susceptibility: High

Well Names	Source IDs
Walsh Property Well	4167000-11G

Mansfield Water Department is supplied from 8 gravel packed wells and one wellfield. The nine sources of water fall within 5 separate Zone II recharge areas. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

The wells are treated with: sodium hypochlorite (oxidation of iron and disinfection); potassium hydroxide (pH control); and sodium fluoride (tooth decay preventative). For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

Land uses of concern within the Zone IIs for Mansfield include residences, commercial facilities, industry, transportation corridors, mining and a capped

landfill. (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Albertini Wells #3 & #4 (4167000-03G & 04G) – The Zone I for these sources contains private residences and local roads.

Zone I: Albertini Wells #2, #3, & #4 and Mahana Well #6 (4167000-03G, 04G, 05G, & 07G) – There is unauthorized access by off-road vehicles (dirt bikes and ATVs) in the Zone I for these sources.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such

as water supply chemicals and maintenance chemicals.

- ✓ Educate residents located in the Zone Is of their potential impacts on the wells.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Use containment for fuel oil storage.
- ✓ Keep any new non water supply activities out of the Zone I.

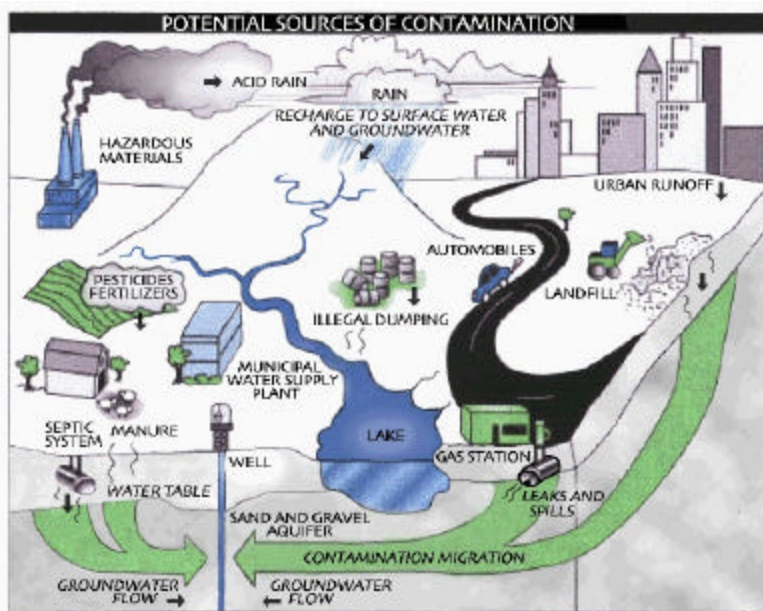
2. Residential Land Uses – Residential land uses within the Zone IIs range from 23% to 36% of the Zone II area. Some areas of the town are sewered while others are not, and so these areas rely on septic systems for waste water disposal. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Target septic system maintenance and proper use at unsewered areas of town.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 95 runs through the Zone II #183 and #514 (see Section 1 of this report for more information on Zone IIs for Mansfield). Secondary highways and local roads are common throughout all of

the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run through Zone II #137, #181 and #182. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

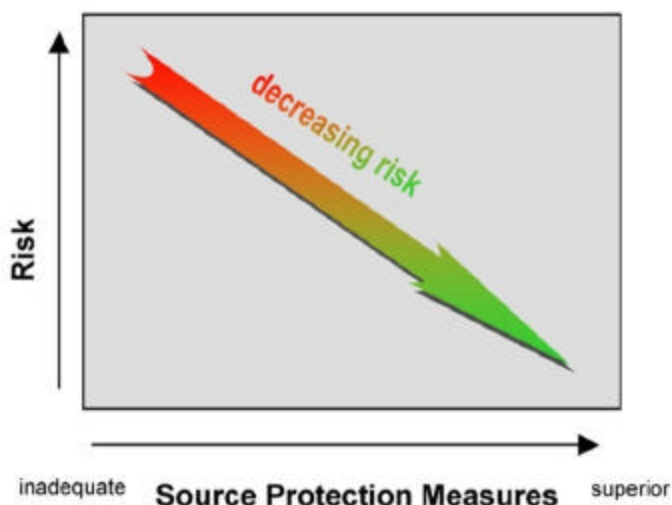


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	2	M	137 & 182	Fertilizers: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	182	Manure (microbial contaminants): improper handling (Emu Farm)
Pesticide Storage or Use	1	H	137	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Gas Stations	3	H	514	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	1	H	514	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	2	M	181 & 182	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids (Pet Cemetery in Foxboro)
Railroad Tracks And Yards	2	H	137 & 181	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Sand And Gravel Mining/Washing	2	M	183 & 514	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	514	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Chemical Manufacture Or Storage	1	H	181	Chemicals and process wastes: spills, leaks, or improper handling or storage
Hazardous Materials Storage	2	H	181	Hazardous materials: spills, leaks, or improper handling or storage
Hazardous Waste Storage, Treatment and Recycling	1	H	181	Hazardous materials: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	Many	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Many	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Many	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Composting Facilities	2	L	181 & 182	Organic material, animal waste, and runoff: storage and improper handling
Landfills and Dumps	1	H	181	Seepage of leachate. (Closed and Capped)
Large Quantity Hazardous Waste Generators	1	H	181	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	5	--	181, 182 & 183	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Stormwater Drains/ Retention	Many	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Many	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	5	H	181 & 514	Stored materials: spills, leaks, or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

- ✓ discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use –All of Mansfield's Zone IIs contain commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



5. Presence of Oil or Hazardous Material Contamination Sites – The Zone IIs contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000792, 4-0000572, 4-0000255, 4-0015168, 4-0015211, 4-0013785, and 40012135. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. A wellhead protection team or committee should be comprised of members representing the town, water supplier, business and citizens. There are resources available to help communities develop a plan for protecting drinking water supply wells.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES/NO	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. (Albertini Well #2 is the only Zone I not controlled by Mansfield Water Department)
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring ATV use and residential activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Mansfield's local controls currently meet DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Continue to work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Implement and update the wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups (Canoe River Aquifer Advisory Committee), neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

Protection Planning Recommendations:

- ✓ Establish a wellhead protection team to help implement the Wellhead Protection Plan for Mansfield Water Department. Update the plan periodically.
- ✓ Keep local controls current with MA Wellhead Protection Regulations 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, gas stations, sand and gravel mining and a target shooting range. Refer to Table 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Passing local controls that meet the MA Wellhead Protection Regulations 310 CMR 22.21(2).
- Developing a Wellhead Protection Plan.
- Passing local regulations to control floordrains.
- Receiving grant money to hire a consultant to perform floordrain inspections.
- Developing a masterplan for the water system.
- New installation of SCADA system and alarms.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Prevent ATV access within the Zone Is.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3 and the Key Issues above.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA
DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
34184	MANSFIELD BODY SHOP	1004 EAST ST	MANSFIELD	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
37594	MANSFIELD DEPT OF PUBLIC WORKS	500 EAST ST RTE 106	MANSFIELD	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
39454	MANSFIELD LANDFILL	EAST ST/RTE 106	MANSFIELD	SLF	CLF	Closed Landfill
131047	CONDEA VISTA CO	751 N MAIN ST	MANSFIELD	HANDLR	LQG	Large Quantity Generator of Haz Waste
131048	ADM COCOA	150 OAKLAND ST	MANSFIELD	PLANT	BM1000	Air Quality Permit
				TURRPT	LQTU	Large Quantity Toxics User
				DISCH	BLW-IV	Below Industrial Waste Water Reg Levels
				HANDLR	SQG	Small Quantity Generator of Haz Waste
131052	STONE CONTAINER CORP	47 MAPLE ST	MANSFIELD	PLANT	BM1000	Air Quality Permit
				HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
132755	RICHARDSON CHARLES A INC	330 OTIS ST	MANSFIELD	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
134150	ELM ST GARAGE INC	549 ELM ST	MANSFIELD	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
312789	SMURFIT STONE	60 MAPLE ST	MANSFIELD	DISCH	IWWSC	Industrial Waste Water to Sewer
				HANDLR	VSQG	Very Small Quantity Generator of Haz Waste

APPENDIX A Continued: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
34439	V W OF NORTH ATTLEBORO INC	563 KELLEY BLVD	NORTH ATTLEBOROUGH	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
37870	SPEEDEE OIL CHANGE & TUNE UP	543 KELLEY BLVD	NORTH ATTLEBOROUGH	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
	SPEEDEE OIL CHANGE & TUNEUP			DISCH	IWWSC	Industrial Waste Water to Sewer
54474	BORO SAND & STONE CO	192 PLAIN ST	NORTH ATTLEBOROUGH	PLANT	BM150	Air Quality Permit
177301	CUMBERLAND FARMS #2069	581-585 KELLEY BLVD	NORTH ATTLEBOROUGH	FULDSP	FULDSP	Fuel Dispenser
211218	SUNOCO #0362-5688	591 KELLEY BLVD	NORTH ATTLEBOROUGH	FULDSP	FULDSP	Fuel Dispenser

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
DPW Highway Garage	500 East Street	Mansfield	Reinforced	2 Walls	I	6000	Gasoline
			Reinforced	2 Walls	I	6000	
			Reinforced	2 Walls	I	2500	Diesel
Cumberland Farms #2069	581-585 Kelley Blvd.	North Attleboro	Reinforced	2 Walls	I	8000	Gasoline
			Reinforced	2 Walls	I	8000	Gasoline
			Reinforced	2 Walls	I	8000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000792	COCASSET ST	FOXBOROUGH	Oil
4-0000572	OFF MORSE ST	FOXBOROUGH	Oil
4-0000255	131 MORSE ST	FOXBOROUGH	Oil and Hazardous Material
4-0015168	500 EAST ST	MANSFIELD	Hazardous Material
4-0015211	50 EAST ST	MANSFIELD	Oil
4-0013785	842 EAST ST	MANSFIELD	Oil
4-0012135	RTE 95 NORTH	MANSFIELD	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Marion Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Marion Water Department
<i>PWS Address</i>	2 Spring Street
<i>City/Town</i>	Marion, Massachusetts
<i>PWS ID Number</i>	4169000
<i>Local Contact</i>	Robert Zora
<i>Phone Number</i>	(508) 748-3540

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

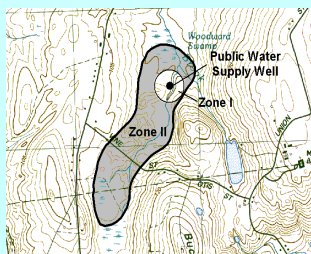
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

IWPA #: 6606

Susceptibility: High

Well Names	Source IDs
South Well	4169000-07G

Zone II #: 198

Susceptibility: High

Well Names	Source IDs
New Bedford Rd. Site (North Well)	4169000-06G

Zone II #: 481

Susceptibility: High

Well Names	Source IDs
Mary's Pond Well	4169000-01G
East Well	4169000-02G
West Well	4169000-03G

Zone II #: 482

Susceptibility: High

Well Names	Source IDs
Main Well	4169000-04G

The Marion Water Division uses 100% ground water supplied from six wells located in three Zone IIs and one Interim Wellhead Protection Area (IWPA) (see above table for details). The majority of the wells, IWPA, and the Zone II areas are within the Town of Rochester. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is, Zone IIs and IWPA.

The water is treated with sodium silicate for the purpose of sequestering iron and manganese and also potassium hydroxide for the purpose of corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Marion are primarily a mixture of forest, residential, and cranberry bog land uses with small areas of commercial and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The six Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Mary's Pond Well 4169000-01G – Mary's Pond Road intersects the Zone I.

Zone I: New Bedford Rd. (North Well) 4169000-06G and South Well 4169000-07G – An electric transmission line right of way intersects both the Zone Is.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store herbicides, pesticides, fertilizers or road salt within the Zone I.
- ✓ Wherever possible, ensure that drains discharge stormwater outside of

the Zone I.

- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land uses are common throughout the Zone Is. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

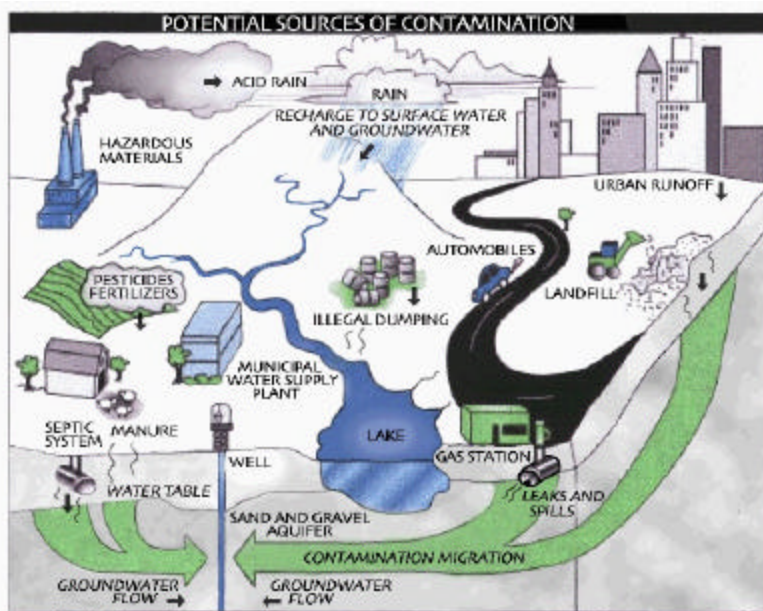
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 195 runs through the Zone II (#482) for the Main Station and Route 105 intersects the other two Zone IIs (#198 and #481). Local roads are common throughout the Zone IIs and IWPA. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater

and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 942-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

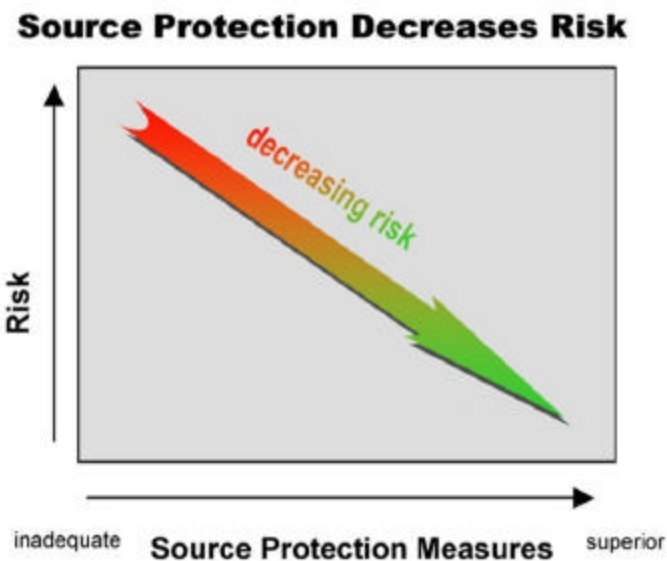


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	several	M	#198, #481, #482 & IWPA	Fertilizers: leaks, spills, improper handling, or over-application (Cranberry bogs, Cornfield & Golf Course)
Pesticide Storage or Use	several	H	#198, #481, #482 & IWPA	Pesticides: leaks, spills, improper handling, or over-application (Cranberry bogs, Cornfield & Golf Course)
Manure Storage or Spreading	1	H	#481	Manure (microbial contaminants): improper handling (Cornfield)
Nurseries	1	M	#198	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application (Christmas Tree Farm)
Commercial				
Junk Yards and Salvage Yards	1	H	#198	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Golf Courses	1	M	#481	Fertilizers or pesticides: over-application or improper handling
Residential				
Fuel Oil Storage (at residences)	numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal

* See Table 2 notes on page 6.

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous				
Aquatic Wildlife	few	L	#198, #481, & #482	Microbial contaminants
Fishing/Boating	few	L	#198 & #481	Fuel and other chemical spills, microbial contaminants
Schools, Colleges, and Universities	1	M	#198	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage (Elementary School)
Stormwater Drains/Retention Basins	several	L	#198, #481, & #482	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: Electric	1	L	#481 & #482	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	M	#198, #481, & #482	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling (Route 195 and Route 105)
Underground Storage Tanks	1	H	#198	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	1	L	#198	Chemicals and other materials including PCBs: spills, leaks, or improper handling

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

4. Hazardous Materials Storage and Use– Small areas of the Zone IIs are used as commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Agricultural Activities – There are several cranberry bogs, a Christmas tree farm and a cornfield within the Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.



- ✓ Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a well. Currently, Marion meets the “Best Effort” requirements for two of its five sources in the Town of Rochester, the South Well IWPA and New Bedford Rd. (North Well) Zone II (#198). Marion does not have protection controls for the Main Station Zone II areas (#482) located within the town of Marion. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Monitor transmission line vegetation control activities in Zone Is in South Well and New Bedford Rd (North Well).
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES/NO	Marion meets DEP's "best effort" requirements for only 2 of its 6 wells. Work toward protection for all wells. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with Rochester to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Protection Planning Recommendations:

- ✓ Coordinate efforts with local officials in Rochester and Marion to pass local wellhead protection controls that meet current MA Wellhead Protection Regulations 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Develop a Wellhead Protection Plan. Establish a protection team with representatives from citizen's groups, business representatives and local officials from Marion and Rochester, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include a golf course. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Fencing to restrict access to public water supply property.
- Posting of "No Trespassing" signs.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue daily Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Develop and implement a Wellhead Protection Plan.
- ✓ Convene a Wellhead Protection Committee with representation from citizen's groups, businesses, and local officials from Marion and Rochester.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
34006	Stevens Collision & Paint Center	92 Pine Street	Rochester	HANDLER	VSQG	Very Small Quantity Generator of Hazardous Waste

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Bell Atlantic ID# 892	118 North Ave	Rochester	Reinforced	2 Walls	I	1000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
There are no DEP Tier Classified sites identified within the Marion Zone IIs.			

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Marshfield Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Marshfield Water Department
<i>PWS Address</i>	870 Moraine Street—2nd Floor
<i>City/Town</i>	Marshfield, Massachusetts
<i>PWS ID Number</i>	4171000
<i>Local Contact</i>	John Patch
<i>Phone Number</i>	(781) 834-5589

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

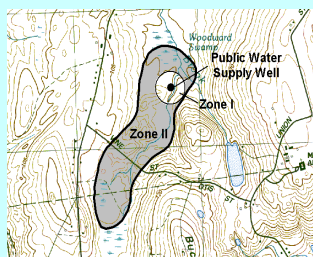
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

IWPA

Susceptibility: High

Well Names	Source IDs
Parsonage St. Well #1 (Inactive)	4171000-02G
Parsonage St. Well #2 (Inactive)	4171000-03G

Zone II #: 22

Susceptibility: High

Well Names	Source IDs
Ferry St. Well	4171000-11G
Church St. Well	4171000-13G

Zone II #: 71

Susceptibility: High

Well Names	Source IDs
Webster Well #1	4171000-10G
Webster Well #2	4171000-12G

Zone II #: 72

Susceptibility: High

Well Names	Source IDs
Mt Skirgo Wells (Wellfield)	4171000-01G

Zone II #: 111

Susceptibility: High

Well Names	Source IDs
Furnace Brook Well #1	4171000-04G
Furnace Brook Well #2	4171000-05G
Furnace Brook Well #3	4171000-06G
Furnace Brook Well #4	4171000-07G
South River St. Well	4171000-08G
Scholl St. Well	4171000-09G

Zone II #: 239

Susceptibility: High

Well Names	Source IDs
Spring St. Well	4171000-16G

Zone II #: 379

Susceptibility: High

Well Names	Source IDs
Union Station #1	4171000-14G
Union Station #2	4171000-15G

The Town of Marshfield's municipal drinking water supply consists of fifteen gravel packed wells and one wellfield, all located within six Zone II and one IWPA (see above table for details). Some of the Zone II areas extend in to the Towns of Pembroke and Duxbury. At this time Parsonage Street Wells #1 & #2 are inactive due to saltwater intrusion, however, an assessment of their IWPA is included in this report. The wellfield has a Zone I area of 250 feet from each wellpoint and the other wells each have a Zone I of 400 feet. The wells are located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached maps to view the boundaries of the Zone Is, IWPA and Zone II.

All of the water that is pumped into the distribution system receives some form of treatment at the pump stations. Each well has its own pump station and lime feeder for corrosion control, and pumps directly into the distribution system. Three of the five wells in the Furnace Brook aquifer require filtration due to the presence of some volatile organic contaminants (VOCs). The wells that are treated for VOC removal are also disinfected with chlorine after treatment. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and IWPA for Marshfield are dominated by forest, non-forested wetlands and residential land uses with smaller areas of commercial, waste disposal and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

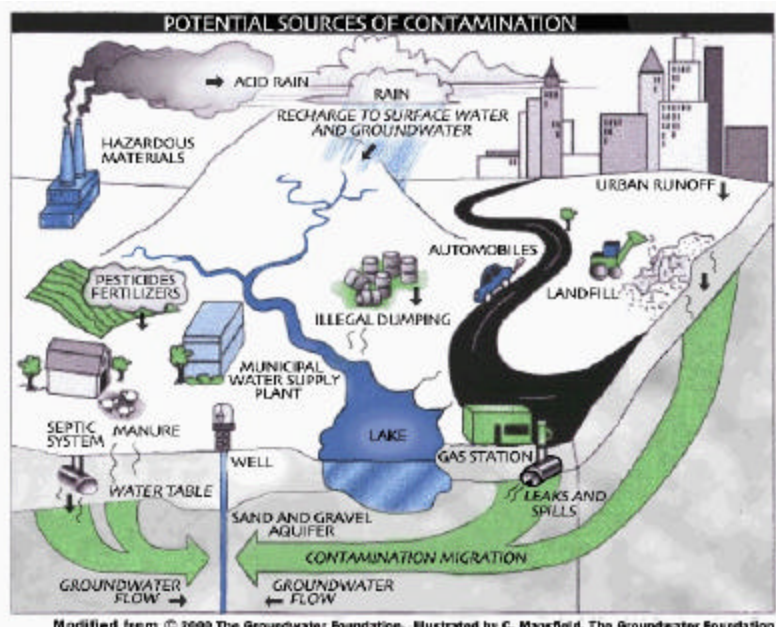
1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead except for the Mt. Skirgo Wells, which is classified as

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



a wellfield, and has a 250 ft protective radius around each of the active eight wellpoints. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. Three of Marshfield's sixteen Zone Is contain non water supply activities, they are:

Zone I: Furnace Brook Well #4 (4171000-04G) – Route 3A runs along the edge of the Zone I and there are residential land uses within the Zone I.

Zone I: Furnace Brook Well #3 (4171000-06G) – Route 3A runs through the Zone I and there are residential land uses within the Zone I.

Zone I: Scholl Street Well (4171000-09G) – Forest Street runs through the Zone I and there are residential land uses within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential areas are prevalent throughout the Zone II and IWPA. About 33% of Marshfield is sewered, however, all of the areas in the Zone II use private septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

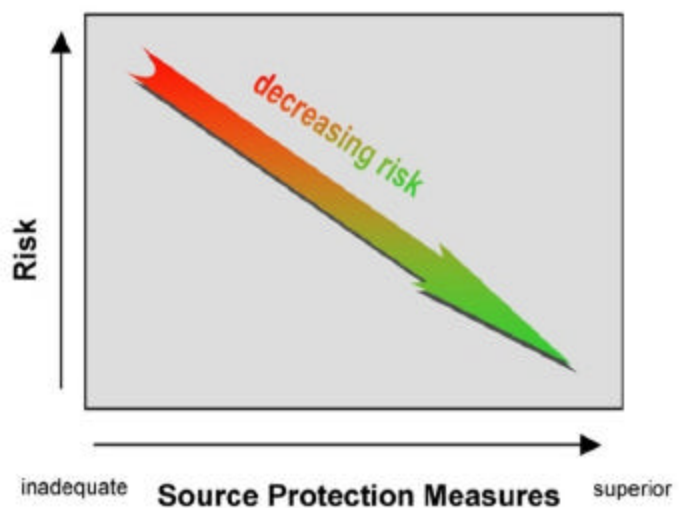


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I, II & IWPA)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	2	M	#71	Fertilizers: leaks, spills, improper handling, or over-application (Cranberry bogs and golf course)
Pesticide Storage or Use	2	H	#71	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Car/Truck/Bus Washes	1	L	#111	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	8	H	#71, #72, #379 & IWPA	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	5	H	#111, 379 & IWPA	Automotive fluids and solvents: spills, leaks, or improper handling
Boat Yards/Builders	1	H	#111	Fuels, paints, and solvents: spills, leaks, or improper handling (Storage)
Cemeteries	1	M	#72	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids (Old)
Funeral Homes	1	L	IWPA	Hazardous chemicals: spills, leaks, or improper handling
Dry Cleaners	1	H	#111	Solvents and wastes: spills, leaks, or improper handling
Golf Courses	2	M	#71 & IWPA	Fertilizers or pesticides: over-application or improper handling
Medical Facilities	3	M	#111 & #379	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (Two dental offices)
Nursing Homes	2	L	IWPA	Microbial contaminants: improper management
Railroad Tracks And Yards	1	H	#22, #71, #111 & IWPA	Herbicides: over-application or improper handling; leaks or spills; clandestine dumping (Old, abandoned)
Repair Shops (Engine, Appliances, Etc.)	3	H	#111, #239 & IWPA	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Research Laboratories	1	M	IWPA	Laboratory chemicals and wastes: spills, leaks, or improper handling or storage (Water Quality Testing)
Sand And Gravel Mining/Washing	1	M	#72	Heavy equipment, fuel storage, clandestine dumping: spills or leaks

Table 2 Continued: Land Use in the Protection Areas (Zones I, II & IWPA)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	#72	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Fuel Oil Distributors	1	H	IWPA	Fuel oil: spills, leaks, or improper handling or storage
Hazardous Materials Storage	4	H	#71, #111, #379 & IWPA	Hazardous materials: spills, leaks, or improper handling or storage
RCRA TSDF Facilities	1	H	#111	Hazardous wastes: spills, leaks, or improper handling or storage (School, treatment of hazardous waste)
Residential				
Fuel Oil Storage (at residences)	Numerous	M	ALL	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	ALL	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	ALL	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Some	L	ALL	Microbial contaminants
Landfills and Dumps	2	H	#22 & #111	Seepage of leachate
Large Quantity Hazardous Waste Generators	1	H	IWPA	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	12	--	#22, #111, #379 & IWPA	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road And Maintenance Depots	1	M	IWPA	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	2	M	#111	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	6	M	#22, #111 & IWPA	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	ALL	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way -	2	L	#22 & #71	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Many	M	ALL	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

Table 2 Continued: Land Use in the Protection Areas (Zones I, II & IWPA)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous - Continued				
Utility Substation Transformers	3	L	#71, #111 & #379	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste	8	L	#22, #111 & IWPA	Hazardous materials and waste: spills, leaks, or improper handling or storage
Waste Transfer/ Recycling Station	1	M	#22	Water contacting waste materials: improper management, seepage, and runoff
Underground Storage Tanks	5	H	#71, #379 & IWPA	Stored materials: spills, leaks, or improper handling

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.



(Continued from page 4)

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 3 and 3A intersect the Zone II #71, #72, #111 and #379. Local roads are common throughout all the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	SOME	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring communities regarding their wellhead protection controls for your Zone II areas.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement goals of plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Formalize plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

wash in to catchbasins. An abandoned rail corridor intersects some of the protection areas.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected if vegetation control is planned.

4. Hazardous Materials Storage and Use – Small areas of the Zone II and IWPA are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains twelve DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 40000866, 40000889, 40001172, 40001210, 40006010, 40006074, 40011993, 40012094, 40013222, 40013675, 40014025, 40015251. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are several cranberry bogs down gradient of the Webster Wells #1 & #2 in Zone II #71. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.
- ✓ Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, the Town has the water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2) for all of its active wells. Protection planning protects drinking water by managing the land area that supplies water to a well. Marshfield has developed a Wellhead Protection Plan, which is a valuable tool for coordinating community efforts, identifying protection strategies, establishing a timeframe for implementation, and providing a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Establish a protection team to assist the community with implementation of the goals in the Wellhead Protection Plan.
- ✓ Coordinate efforts with local officials to ensure local wellhead protection controls are current with MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include gas stations, landfills and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Marshfield's Zone II and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Conducting a nitrate loading study at the Webster Wells to determine if sewerage of residences in the Zone II will reduce the nitrate levels at the wells.
- Taking an active role in increasing security at the wells through increased police patrols, fencing and alarming.

- Also, studying the feasibility of installing security cameras at pump stations.
- Passing the local controls, including floordrain health regulations, that meet DEP's Wellhead Protection Controls, 310 CMR 22.21(2).

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Develop a formal Emergency Response Plan.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 4

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
32231	MARSHFIELD HILLS GARAGE	1944 MAIN ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
33165	SAMPSON AUTO BODY	903 PLAIN ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
37261	MARTINSON JUNIOR HIGH SCHOOL	FOREST ST	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator
37458	ANASTASI BROTHERS CORP	853 PLAIN ST	MARSHFIELD	Generator of Hazardous Waste	RECYCLER - BURNER/BLENDER
37458	ANASTASI BROTHERS CORP	853 PLAIN ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
39466	SYLVESTER RAY INC	CLAYPIT RD	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
39466	SYLVESTER RAY DEMO LANDFILL	CLAY PIT RD	MARSHFIELD	Demolition Site	Closed Landfill
39468	MARSHFIELD MUNICIPAL LANDFILL	23 CLAY PIT RD	MARSHFIELD	Sanitary Landfill	Landfill
39468	MARSHFIELD TOWN OF	CLAY PIT RD	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator
54107	SOUTHERN REDI MIX	CLAY PIT RD	MARSHFIELD	Generator of Hazardous Waste	Air Quality Permit
54107	SOUTHERN REDI MIX	CLAY PIT RD	MARSHFIELD	Plant	Air Quality Permit
54111	MARTINSON MIDDLE SCH	S. RIVER RD	MARSHFIELD	Plant	Air Quality Permit
130831	ANTONS CLEANERS OF MARSHFIELD	668 PLAIN RTE 139	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator
130832	MARSHFIELD HIGH SCHOOL	89 FOREST ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
130832	HIGH SCHOOL	FOREST ST	MARSHFIELD	Plant	Air Quality Permit
133960	STEVES EQUIPMENT SERVICE INC	15 CLAY PIT RD	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 2 of 4

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
133962	PLAZA CLEANERS	933R WEBSTER ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
133962	PLAZA CLEANERS	933R WEBSTER ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
205242	FURNACE BROOK MID SC	76 SOUTH RIVER RD.	MARSHFIELD	Plant	Air Quality Permit
262585	PUBLIC PETROLEUM INC	1933 OCEAN ST	MARSHFIELD	Fuel Dispenser	Fuel Dispenser
265178	MIDAS MUFFLER & BRAKE	2169 OCEAN ST	MARSHFIELD	Industrial Wastewater Holding Tank Approval	Industrial Waste Water Holding Tank
271362	MARSHFIELD AUTO CENTER	2126 OCEAN ST	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
280093	ONSITE LUBRICATION	846 WEBSTER ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
280093	ONSITE LUBRICATION	846 WEBSTER ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
280093	ONSITE LUBRICATION	846 WEBSTER ST	MARSHFIELD	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
295555	CVS 832	SNOW RD	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator
312891	BRITEWAY CAR WASH	535 PLAIN ST	MARSHFIELD	Ground Water Facility (BRP)	Groundwater Discharge
325515	SHELL 137791	2126 OCEAN ST	MARSHFIELD	Fuel Dispenser	Fuel Dispenser
333153	CVS 2401	1874 OCEAN RD	MARSHFIELD	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste
337391	PLYMOUTH COLUN INC	125 ENTERPRISE DR	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
345009	SCITUATE RAY PRECAST	CLAY PIT RD	MARSHFIELD	Generator of Hazardous Waste	Air Quality Permit
358033	HESS 21324	2139 OCEAN ST	MARSHFIELD	Fuel Dispenser	Fuel Dispenser

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 3 of 4

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
358033	AMERADA HESS CORP	2139 OCEAN ST	MARSHFIELD	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
367922	BROOKS PHARMACY	1900 OCEAN ST	MARSHFIELD	Generator of Hazardous Waste	Small Quantity Generator

Continues on following page.

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
HESS #21324 ID #13699	2139 OCEAN ST	MARSHFIELD	Reinforced	2 Walls	Interstitial Monitoring	10000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	10000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	10000	Gasoline
PETROL PLUS ID #13693	1933 OCEAN ST	MARSHFIELD	Steel	1 Wall		275	Fuel Oil
			Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
			Reinforced	2 Walls	Interstitial Monitoring	8000	Gasoline
MOBIL R/S #12720 ID #14010	208 CHURCH ST	PEMBROKE	Reinforced	1 Wall	Approved In-Tank Monitor	6000	Diesel
			Reinforced	1 Wall	Approved In-Tank Monitor	8000	Gasoline
			Reinforced	1 Wall	Approved In-Tank Monitor	10000	Gasoline
			Reinforced	1 Wall	Approved In-Tank Monitor	12000	Gasoline
			Reinforced	1 Wall	Approved In-Tank Monitor	1000	Waste Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000866	668 PLAIN ST	MARSHFIELD	Hazardous Material
4-0000889	CLAY PIT RD	MARSHFIELD	Oil
4-0001172	89 FOREST ST	MARSHFIELD	Hazardous Material
4-0001210	PARSONAGE ST RTE 139	MARSHFIELD	Hazardous Material
4-0006010	1933 OCEAN ST	MARSHFIELD	Oil
4-0006074	CHURCH AND OAK ST	MARSHFIELD	Oil
4-0011993	1896 OCEAN ST	MARSHFIELD	Hazardous Material
4-0012094	535 PLAIN ST	MARSHFIELD	Hazardous Material
4-0013222	700 PLAIN ST	MARSHFIELD	Oil
4-0013675	696 PLAIN ST	MARSHFIELD	Hazardous Material
4-0014025	714 WEBSTER ST	MARSHFIELD	Oil
4-0015251	1901 OCEAN ST	MARSHFIELD	Oil and Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Lakeside Trailer Park

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Lakeside Trailer Park
PWS Address	Route 151
City/Town	Mashpee, Massachusetts 02649
PWS ID Number	4172001
Local Contact	William Haney
Phone Number	(508) 477-8828

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4172001-01G	269	701	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Appendix
5. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Lakeside Trailer Park is located west of the park in a wooded area. The well has a Zone I of 269 feet and an Interim Wellhead Protection Area (IWPA) of 701 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection area that are potential sources of contamination.

Key issues include:

1. **Zone I;**
2. **Gasoline station with Underground storage tank (UST);**
3. **Garden Center;**
4. **Septic systems, and;**
5. **Funeral Home.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of a High threat within the IWPA.

1. **Zone Is** – Currently, the well does meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Never use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Keep non-water supply activities out of your Zone I.
2. **Gasoline station with Underground storage tank (UST)** – A gasoline station is located north of the well on Route 151. The gasoline is stored in two underground storage tanks. Underground storage of hazardous materials can be a potential source contamination due to leaks or spills of the chemicals they store. Proper stormwater management at gasoline stations is critical to water supply protection due to the nature of operations at gasoline/service stations and the types of chemicals involved.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Gas/Service Station	No	Yes	High	Gasoline and other hazardous materials.
Garden Center	No	Yes	High	Fertilizer and Pesticide use and storage
Funeral Home	No	Yes	Low	Hazardous materials: spills, leaks, or improper handling
Septic systems	No	Yes	Moderate	bacteria, improper disposal of hazardous materials
Roads	No	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendation:

- ✓ Educate the neighboring gasoline/service station about the location of your well and IWPA.
- ✓ Encourage the gasoline/service station to use BMP's for the storage, handling, and disposal of all hazardous chemicals.
- ✓ If the gasoline/service station has floor drains, ensure that the floor drains lead to a tight tank or municipal sewer as required by the plumbing code and Underground Injection Control Regulations, 310 CMR 27.00..

3. **Garden Center** – Fertilizers, pesticides and other gardening products contain hazardous materials that make them potential contaminants to ground water if improperly managed. Following BMPs can prevent contamination from mishandling and spillage of these products.

Recommendation:

- ✓ Educate the neighboring businesses about the location of your well and IWPA.
- ✓ Encourage use of BMPs for applying, handling, and storing pesticides and fertilizers or other hazardous materials.
- ✓ Ensure proper stormwater management practices are in place at the garden center.

4. **Funeral Home** – There is a funeral home on the edge of the IWPA. Funeral homes use chemicals that have the potential to contaminate groundwater if improperly managed.

Recommendation:

- ✓ Educate the funeral home about the location of your well to their facility and the potential impacts their operations might have on your well.
- ✓ Ensure that hazardous materials are properly managed and are not allowed into groundwater through a septic system or another route.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Lakeside Trailer Park is commended for

purchasing and controlling their entire Zone I area. The Park should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Ensure non-water supply activities are kept out of the Zone I.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

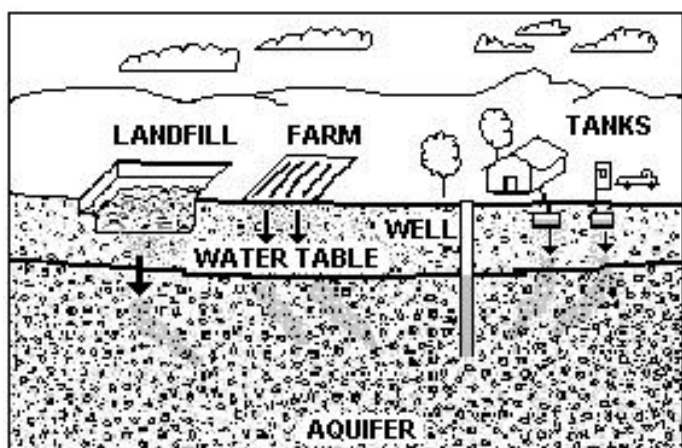


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Training and Education:

- ✓ Train your staff and neighboring businesses on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff from Route 151 is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Ensure your and neighbors' septic system components are located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Appendix
- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form

Appendix: Regulated Facilities in Protection Area

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
375482	Rapid Refill Mashpee (Sunoco)	414 Nathan Ellis HWY.	Mashpee	FULDSP	Fuel Dispenser

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
RAPID REFILL ID #1409	414 NATHAN ELLIS HWY	MASHPEE	Reinforced	2 Walls	Interstitial Monitoring	550	Waste Oil
			Steel w/ H	2 Walls	Interstitial Monitoring	15000	Gasoline
			Steel w/ H	2 Walls	Interstitial Monitoring	15000	Gasoline/D

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Beechwood Point Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date DRAFT Prepared:
August 27, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Beechwood Point Condominiums
PWS Address	Santuit Pond Road
City/Town	Mashpee, Massachusetts
PWS ID Number	4172035
Local Contact	David Rich
Phone Number	(508) 564-1118

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4172035-01G	200	620	Moderate
Well No. 2	4172035-02G	200	620	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The two wells for Beechwood Point Condominiums are located southwest of Santuit Pond Road and northwest of Beechwood Point Road. Both wells have a Zone I radius of 200 feet and an Interim Wellhead Protection Area (IWPA) radius of 620 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Residential Land Uses; and**
3. **Athletic Field.**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well meets DEP's restrictions, which only allow water supply related activities in Zone Is.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- 2. **Residential Land Uses** –All of the residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:
 - ✓ **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
 - ✓ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone Is	IWPAs	Threat	Comments
Fuel Oil Storage	No	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	No	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Septic Systems	No	Yes	Moderate	See septic systems brochure in the appendix
Roads and Driveways	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Field	No	Yes	Moderate	Fertilizer and pesticide use

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

✓ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

✓ **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

3. **Athletic Fields** – The pesticides and fertilizers used for lawn care and gardening can be transported from the ground surface down into the aquifer with storm water and excess irrigation water. The over-application or improper storage and disposal of pesticides and fertilizers could result in contamination of the aquifer.

Recommendation:

✓ Inform maintenance staff and contractors about the areas that are located within the IWPA's of the public water supply wells and instruct them to use proper storage, disposal, and application procedures with pesticides and fertilizers.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Beechwood Point Condominiums is commended for restricting vehicle access to the Zone I by gating the access road and posting the Zone I with public drinking water supply signs. Beechwood Point Condominiums should review and adopt the key recommendations above and the following:

Priority Recommendations:

✓ Inform residents that reside within the IWPA's that they are in a wellhead protection area for a public water supply well. Educate them on the hazards to the water quality associated with the improper disposal of oil, chemicals, or hazardous materials to the

ground surface or septic system.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and groundskeepers. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

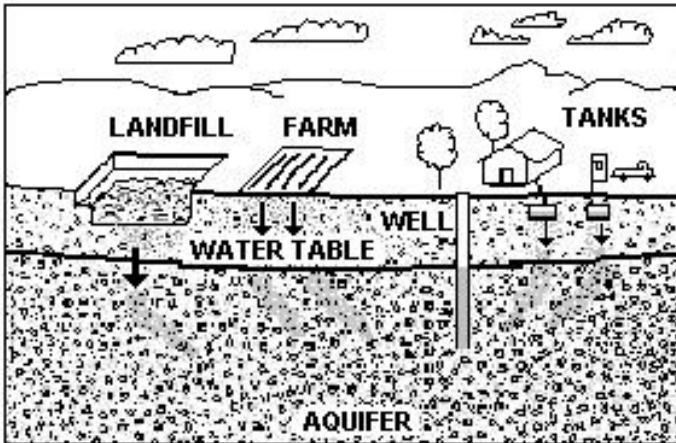


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on the property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Mashpee Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Mashpee Water Department
<i>PWS Address</i>	79 Industrial Dr
<i>City/Town</i>	Mashpee, MA 02649
<i>PWS ID Number</i>	4172039
<i>Local Contact</i>	David Rich
<i>Phone Number</i>	(508) 477-6767

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

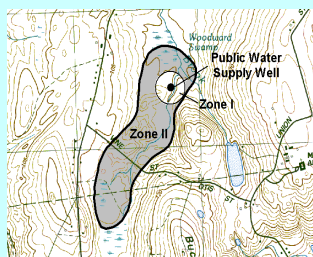
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 348

Susceptibility: High

Well Names	Source IDs
Rock Ldg. Well #2	4172039-02G
Rock Ldg. Well #3	4172039-03G

Zone II #: 349

Susceptibility: High

Well Names	Source IDs
Quaker Run Well #4	4172039-04G

Zone II #: 411

Susceptibility: High

Well Names	Source IDs
Turner Road Well #5	4172039-05G

Zone II #: 518

Susceptibility: High

Well Names	Source IDs
Mashpee Village Well	4172039-06G

The five currently active wells for the Mashpee Water District are located in four Zone II areas. The wells are all within the Town of Mashpee, but a small area of Zone II #348 extends in to the Town of Falmouth, and both Zone II #348 and #349 extend in to the Town of Sandwich. Each of the wells has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

Water from the wells is pH adjusted for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for the Mashpee Water District are a mixture of forested, residential, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors

4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The five (5) Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells.

4172039-06G Mashpee Village Well - There are local roads and homes within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – A portion of the Zone II consists of residential areas. Less than 5% of the areas have public sewers, and so the remainder use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals

to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

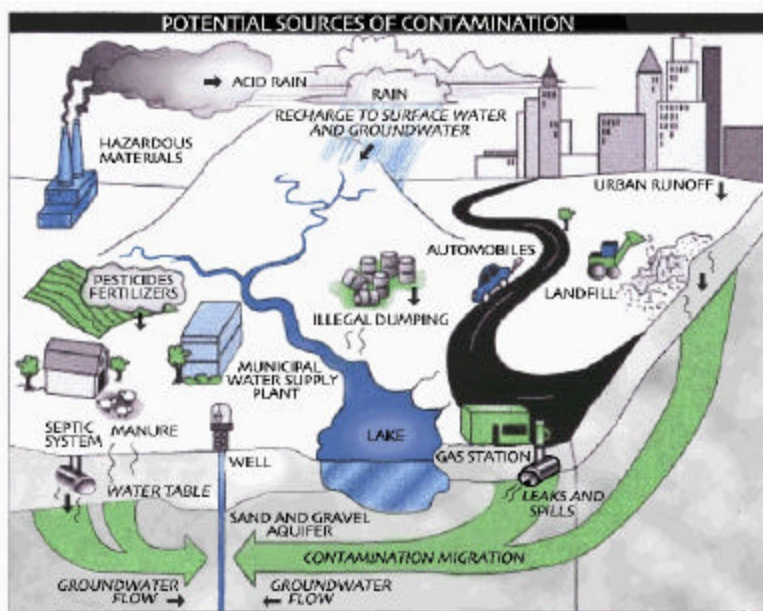
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Routes 28 and 151 run through the Zone II. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – A small percentage of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

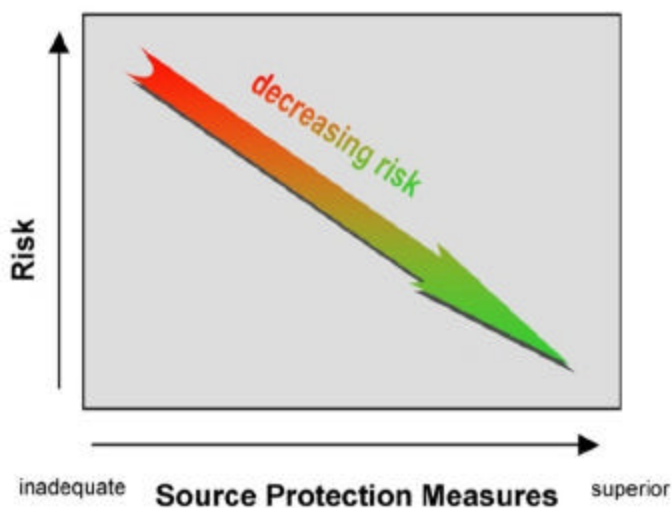


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II) - continued on page 6

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Pesticide Storage or Use	Few	H	#348, #349, #518	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Funeral Homes	1	L	#518	Hazardous chemicals: spills, leaks, or improper handling
Golf Courses	2	M	#348, #518	Fertilizers or pesticides: over-application or improper handling
Medical Facilities	1	M	#348	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Industrial				
Industry/Industrial Parks	1	H	#348, #411	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	Many	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Many	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Many	M	All	Hazardous chemicals: microbial contaminants, and improper disposal

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Table 2: Land Use in the Protection Areas (Zones I and II) - continued

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous				
Aquatic Wildlife	Several	L	#348, #349	Microbial contaminants
Fishing/Boating	Several	L	#348, #349	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste Generators	1	H	#348	Hazardous materials and waste: spills, leaks, or improper handling or storage. (MMR)
Military Facilities (MMR)	1	H	#348, #349	Pesticides and herbicides, fuel, chemicals and other materials: spills, leaks, or improper handling or storage; may include ordnance or waste landfill/dump sites
Schools, Colleges, and Universities	1	M	#348, #518	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way	1	L	#348, #349, #411	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

* See Table 2 Notes on Page 5.

(Continued from page 4)

floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 4-0016785. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are several cranberry bogs within the Zone II. As is the case for many crops, the commercial production of cranberries usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts

Department of Food and Agriculture including all applicable training and recertification courses and follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.

- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>

7. Protection Planning – Currently, the Town of Mashpee does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2), however, those controls don't yet cover all of the Zone II areas within Mashpee. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Update and implement your Wellhead Protection Plan as needed. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not cover all Zone II areas or they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.>

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

env.state.ma.us/.



Other land uses and activities within the Zone II include a military installation that is also a federal Superfund Site, golf courses, and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	SOME	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	SOME	Work with Sandwich and Falmouth to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update and implement your wellhead protection plan as needed. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish formal committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and residential uses within the Zone II.

the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Providing drinking water education to local schools.
- Keeping the water commissioners involved in planning and development decision-making.
- Working with local environmental organizations to protect Zone II areas.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Implement and update your Wellhead Protection Plan as needed.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Appendix A: Regulated Facilities Within The Water Supply Protection Area

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
35639	CORMIERS 151 SHELL	RTE 151	MASHPEE	Generator of Hazardous Waste	Small Quantity Generator
301420	SOUTHPORT ON CAPE COD	RTE 151 & OLD BARNSTABLE RD	MASHPEE	Ground Water Facility (BRP)	Groundwater Discharge
310151	CAPE COD ROASTERS	RTE 130	MASHPEE	Plant	Air Quality Permit
331207	MASHPEE MEDICAL FACILITY	5 INDUSTRIAL DR	MASHPEE	Ground Water Facility (BRP)	Groundwater Discharge
331530	NEW SEABURY DEVELOPMENT ON CAPE COD	FAIRWAY LN	MASHPEE	Ground Water Facility (BRP)	Groundwater Discharge
375482	RAPID REFILL MASHPEE	414 NATHAN ELLIS HWY	MASHPEE	Fuel Dispenser	Fuel Dispenser

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
RAPID REFILL MASHPEE	414 NATHAN ELLIS HWY	MASHPEE	Gas Station	2 Wall	Interstitial Space Monitor	15000	Gasoline
				2 Wall	Interstitial Space Monitor	15000	Gasoline/ Diesel
				2 Wall	Interstitial Space Monitor	550	Waste Oil

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0016785	GREENWAY RD	Sandwich	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Mattapoisett Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Mattapoisett Water Department
<i>PWS Address</i>	33 Church Street
<i>City/Town</i>	Mattapoisett, MA 02739
<i>PWS ID Number</i>	4173000
<i>Local Contact</i>	William T. Nicholson
<i>Phone Number</i>	(508) 758-4161

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

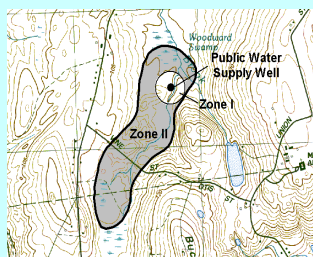
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 199

Susceptibility: High

Well Names	Source IDs
Well #5	4173000-05G

Zone II #: 28

Susceptibility: High

Well Names	Source IDs
Station #3 GP	4173000-03G
Station #4 GP	4173000-04G

Zone II #: 560

Susceptibility: High

Well Names	Source IDs
PS #2 Wellfield	4173000-02G

IWPA

Susceptibility: High

Well Names	Source IDs
GP Well #1 (inactive)	4173000-01G

The five wells for the Mattapoisett Water Department are located in three Zone II and an IWPA. The Zone II #560 extends into the Town of Acushnet and the Zone II #199 extends into Acushnet and the Town of Rochester. Zone II# 28 is contained completely within the Town of Mattapoisett. The GP Well #1 (01G) has been inactive for longer than five years and would need to go through a modified DEP New Source Approval process, which would include assessment of potential sources of contamination, prior to reactivation. The other four wells are all active. The PS #2 Wellfield (02G) Zone I is a 250 foot radius around each wellpoint, effectively a 250 foot radius around the perimeter of the wellfield. Each of the other wells has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I, IWPA, and Zone II.

Water from the wells is pH adjusted for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and IWPA for the Mattapoisett Water Department are a mixture of residential, agricultural, and forested land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are

listed in Table 2.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Agricultural activities - Cranberry Bogs
3. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells other than the wellfield is a 400 foot radius around the wellhead. The Zone I for the wellfield (02G) is a 250 foot radius around each wellpoint, effectively a 250 foot radius around the perimeter of the wellfield. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone I for wells 03G, 04G, and 05G are owned or controlled by the public water system, while the Zone I for wells 01G and 02G are not. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: 4173000-02G - The wellfield has one residential property within the Zone I area.

Zone I: 4173000-03G - There is a portion of the Zone I area which is hayfield or cropland.

Zone I: 4173000-01G - There is a portion of the Zone I area which is cropland, and the 195 transportation corridor passes within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the

Zone Is to comply with DEP's Zone I requirements.

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

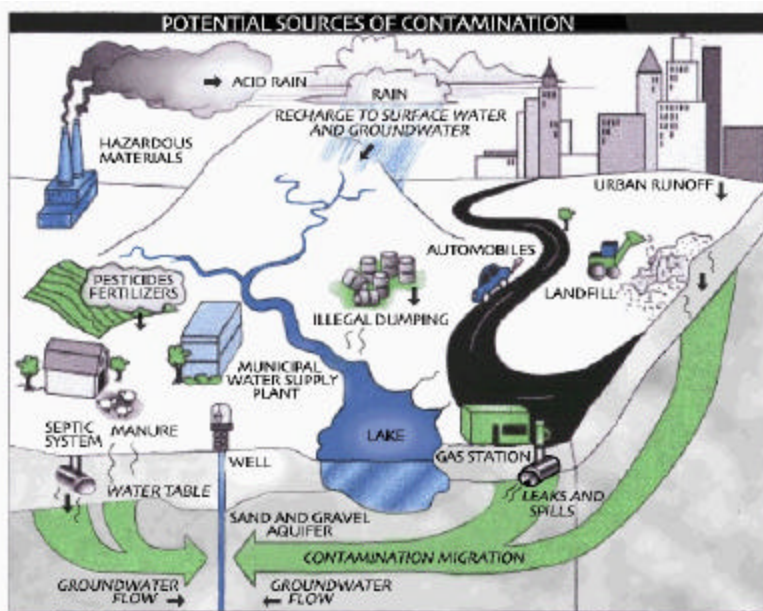
2. Agricultural activities - There are several cranberry bogs within the Zone II. As is the case for most other crops, the commercial production of cranberries usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses and follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Residential Land Uses – Parts of the Zone II consist of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in the appendix and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.

Source Protection Decreases Risk

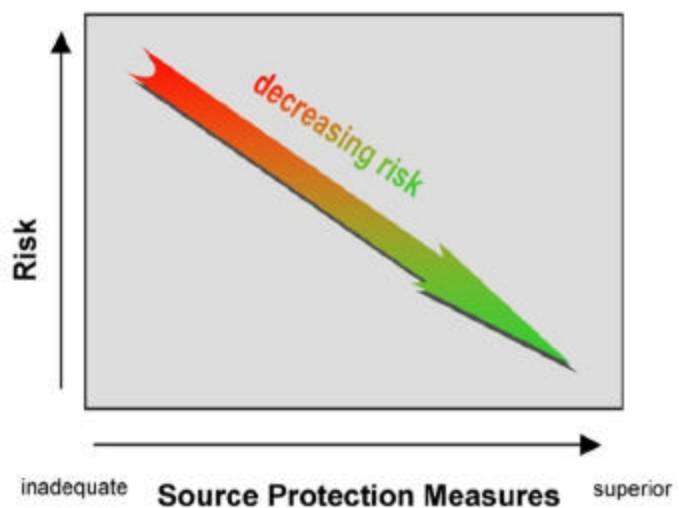


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

(Continued on page 6)

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	10	M	All	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	10	H	All	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Cemeteries	2	M	#28, #199	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Sand And Gravel Mining/Washing	1	M	#28	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Hazardous Materials Storage	1	H	#199	Hazardous materials: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	25+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	25+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	25+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal

Table 2 Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Table 2: Land Use in the Protection Areas (Zones I and II)
(continued)

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous				
Aboveground Storage Tanks	25+	M	All	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Few	L	All	Microbial contaminants
Fishing/Boating	Few	L	All	Fuel and other chemical spills, microbial contaminants
Road And Maintenance Depots	1	M	#28, #199	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	1	M	#28, #199	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	Several	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	2	L	All except IWPA	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Few	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

*See Table 2 notes on page 5.

(Continued from page 4)

- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

4. Transportation Corridors - Route 105 runs through the Zone II #199, and Interstate 195 passes just south of the Zone II #560 and through the IWPA for 01G. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

5. Hazardous Materials Storage and Use – A small percentage of the land area within the Zone II is commercial land uses. Many small businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or

floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in the appendix and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

6. Protection Planning – Currently, the Town of Mattapoisett does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Update and implement your Wellhead Protection Plan as needed. Refer your protection team to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.



Refer to Table 2 for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	SOME	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	SOME	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	SOME	Continue to work with neighboring municipalities to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Implement and update your wellhead protection plan. When updating, follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Encourage the committee to include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at agricultural and residential uses within the Zone II.

(Continued from page 7)

commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Working with Rochester to protect Zone II areas within the town.
- Protecting Zone II areas within the Town of Mattapoisett with an Aquifer Protection Bylaw.
- Working closely with building inspectors and zoning inspectors to protect Zone II areas.
- Conducting ongoing outreach and public education to schools and consumers.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and the appendix.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendix

Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
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4. Draft Land/Associated Contaminants Matrix



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Middleborough Water Supply

What is SWAP?

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- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Middleborough Water Supply
<i>PWS Address</i>	48 Wareham Street
<i>City/Town</i>	Middleborough
<i>PWS ID Number</i>	4182000
<i>Local Contact</i>	Richard Tinkham
<i>Phone Number</i>	(508) 946-2482

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

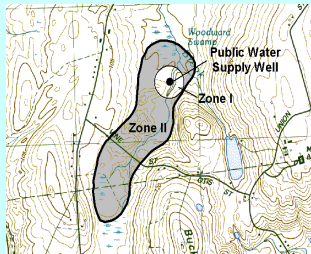
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 24

Susceptibility: High

Well Names	Source IDs
GP Well #1 E. Main St.	41820000-03G
GP Well #2 E. Main St.	41820000-07G

Zone II #: 261

Susceptibility: High

Well Names	Source IDs
E. Grove St Dug Well	41820000-04G

Zone II #: 265

Susceptibility: High

Well Names	Source IDs
GP Well Miller St.	41820000-06G
GP Well Rock Village	41820000-01G
GP Well Rock Village	41820000-02G

Zone II #: 273

Susceptibility: Moderate

Well Names	Source IDs
GP Well #1 Tispaquin	41820000-05G
GP Well #2 Tispaquin	41820000-10G

Zone II #: 341

Susceptibility: High

Well Names	Source IDs
GP Well Cross St.	41820000-09G

Zone II #: 342

Susceptibility: Moderate

Well Names	Source IDs
GP Well Plympton St.	41820000-08G

Zone II #: 343

Susceptibility: High

Well Names	Source IDs
GP Well Spruce St.	41820000-11G

The eleven wells for the Middleborough Water Supply are located in seven Zone II within the town of Middleborough. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

All eleven wells have potassium hydroxide added for corrosion control and sodium hypochlorite added as a disinfectant. Wells 4182000-03G, 04G, 05G, 07G, and 10G are treated to remove iron. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Middleborough are a mixture of residential, cropland, forested, and commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Inappropriate Activities in Zone Is
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water

supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is –

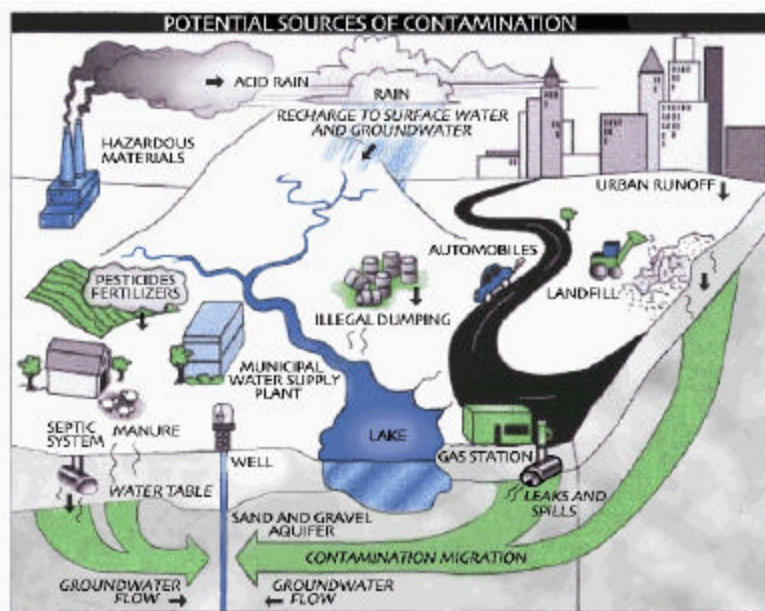
The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The eleven (11) Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



4182000-06G - I-495 passes along the outer edge of the Zone I.
 4182000-05G and 4182000-10G - There are residences within the Zone I.
 418200009G - There is a former sand and gravel pit within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct road runoff away from the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – All of the Zone II consists of at least some residential areas. Some of the areas have public sewers, but most use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential

contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 942-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

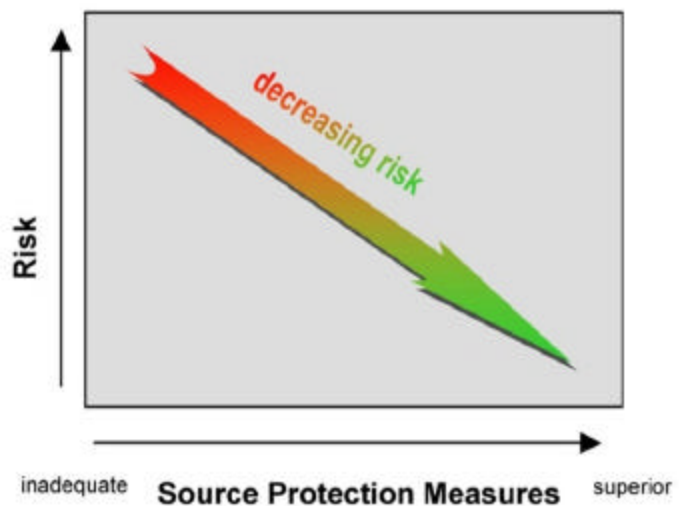


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	2	M	#343, #24	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	2	H	#343, #24	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Gas Stations	3	H	#261	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Laundromats	2	L	#261	Wash water: improper management
Railroad Tracks And Yards	1	H	#261, #341, #343	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Repair Shops (Engine, Appliances)	2	H	#265	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	50+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	50+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	50+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	Several	M	All	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Few	L	#261, #273	Microbial contaminants
Fishing/Boating	Several	L	#261, #265, #273	Fuel and other chemical spills, microbial contaminants
Oil or Hazardous Materials Sites	7	--	#261, #341	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	1	M	#261	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage

* See notes for Table 2 on page 10.

(Continued from page 4)

3. Transportation Corridors - I-495 runs through the Zone II # 265 and Routes 44 and 28 run through several of the Zone II. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run through the Zone II #261, #341, and #343. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use— There are small areas of commercial

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



or industrial land use within Zone II #261, #265, #273, and #341. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

(Continued on page 8)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Middleborough "Aquifer Protection District" meets DEP's current requirements for wellhead protection. Refer to mass.gov/dep/brp/dws/ for current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	N/A	Zone II do not extend in to neighboring communities.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Continue to update and augment your wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial and residential uses within the Zone II.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 40000427, 40001086, 40015059, 4-0012655, 4-0015652, 4-0014992, and 4-011589. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are several areas of cropland or cranberry bogs within Zone II #343, #346, and #24. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, Middleborough does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include are listed in Table 2. Refer to Table 2 and the appendices for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Local controls that meet MA DEP Wellhead Protection regulations 310 CMR 22.21(2).
- Fencing wellheads to prevent unauthorized access.
- Patrolling the Zone I with police assistance and by encouraging citizen participation in patrolling the Zone I.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Table 2 Notes (page 5):

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
37733	EAST GROVE DRY CLEANING	78 E GROVE ST	MIDDLEBOROUGH	Generator of Hazardous Waste	Very Small Quantity Generator
39499	MIDDLEBORO LANDFILL	BROOK ST	MIDDLEBOROUGH	Sanitary Landfill	Landfill
126834	SUNOCO #0013-8651	90 SOUTH MAIN ST	MIDDLEBOROUGH	Fuel Dispenser	Fuel Dispenser
136929	RON'S CITGO	407 WAREHAM ST	MIDDLEBOROUGH	Fuel Dispenser	Fuel Dispenser
177269	CUMBERLAND FARMS #2066	87 EAST GROVE ST	MIDDLEBOROUGH	Fuel Dispenser	Fuel Dispenser
215447	SCOTT'S AUTO BODY	15 CUSHMAN ST	MIDDLEBOROUGH	Generator of Hazardous Waste	Very Small Quantity Generator
287580	LOUIS M GERSON COMPANY	SUMNER AVE	MIDDLEBOROUGH	Generator of Hazardous Waste	VQG-MA
325584	SHELL 137797	2 WEST GROVE ST	MIDDLEBOROUGH	Fuel Dispenser	Fuel Dispenser
329070	GAVIGAN EQUIPMENT CORPORATION	408 WAREHAM ST	MIDDLEBOROUGH	Generator of Hazardous Waste	Small Quantity Generator of Waste Oil or PCBs
376656	CONOCOPHILLIPS EXXON 2634725	150 SOUTH MAIN ST	MIDDLEBOROUGH	Fuel Dispenser	Fuel Dispenser

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
ACE TIRE CO.	62 E. GROVE ST	MIDDLEBOROUGH	VEHICLE DEALER	REMOVED			
CONOCO PHILLIPS EXXON #2634725	150 S MAIN ST	MIDDLEBOROUGH	GAS STATION	2 Wall	Interstitial Space Monitor	12000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	Interstitial Space Monitor	8000	Diesel
CUMBERLAND FARMS #2066	87 E GROVE ST	MIDDLEBOROUGH	GAS STATION	1 Wall		8000	Gasoline
				1 Wall		8000	Gasoline
				1 Wall		8000	Gasoline
				2 Wall	Interstitial Space Monitor	12000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Gasoline
JARDIN INC	CAMBRIDGE ST EXT	MIDDLEBOROUGH	OTHER	REMOVED			

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000427	NORTH OF SUMNER AVE	MIDDLEBOROUGH	Hazardous Material
4-0001086	WEST AVE	MIDDLEBOROUGH	Oil
4-0015059	CAMBRIDGE ST	MIDDLEBOROUGH	Oil
4-0012655	129 S MAIN ST	MIDDLEBOROUGH	Oil
4-0015652	150 SOUTH MAIN ST	MIDDLEBOROUGH	Hazardous Material
4-0014992	58 GROVE ST	MIDDLEBOROUGH	Oil and Hazardous Material
4-011589	SOUTH MAIN ST	MIDDLEBOROUGH	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Fairhaven's Incorporated

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May 22, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Fairhaven's Incorporated
PWS Address	334 Marion Road
City/Town	Middleborough, Massachusetts 02346
PWS ID Number	4182003
Local Contact	Edwin Mello
Phone Number	(508) 947-1660

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4182003-01G	181	478	Moderate
Well #2	4182003-02G	181	478	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Fairhaven's Inc is a rest home serving a population of 28 people. The facility is supplied by two ground water wells; Well #1 is 360 feet deep and Well #2 is 245 feet deep. The wells for Fairhaven's are located about 230 feet behind the facility on the edge of a forested area. Well #1 and Well #2 each have a Zone I radius of 181 feet and an Interim Wellhead Protection Area (IWPA) radii of 478 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The wells serving the facility are treated with potassium carbonate for corrosion control. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 and review a copy of the most recent Consumer Confidence Report.

Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Aboveground Storage Tank (AST) With Heating Oil; and**
3. **Hazardous Materials Storage.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contain a portion of a maintenance shed for the facility. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ When feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
2. **Aboveground Storage Tank (AST)** – There is an AST located in the basement of the Fairhaven main building. If managed improperly, Aboveground Storage Tanks

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Storage, and use of hazardous materials	Both Wells	Both Wells	Moderate	Maintenance materials and gasoline storage in shed.
Parking lot, driveways & roads	Both Wells	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
Septic Systems	No	Both Wells	Moderate	See septic systems brochure in the appendix
Fuel Storage Above Ground	No	Both Wells	Moderate	3 – 275 gallon heating oil tanks in basement of main facility building.
Structures	Both Wells	Both Wells	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

can be a potential source contamination due to leaks or spills of the chemicals they store.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete liquid volume, should a spill occur.
- ✓ Upgrade oil storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. **Storage, use, and handling of hazardous materials** - The maintenance garage is located within the Zone I of the wells. The garage was tidy, with no evidence of significant amounts of materials storage or spills. Although the garage has a cement floor and there are no floor drains, the materials kept within the garage (gasoline power generator, lawn mower and small amounts of petroleum products) could pose a potential threat to the well if managed improperly, due to proximity to the wells and the potential for accidental release.

Recommendation:

- ✓ Consider an alternative storage facility away from the Zone I. Until an alternative storage site is available, provide secondary containment and proper management of these materials.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Fairhaven Incorporated is commended for locating their new septic system across the street, placing it outside of the Zone I for the wells. Fairhaven Incorporated should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Provide containment for the heating oil tanks to prevent groundwater contamination if leakage occurs.
- ✓ Provide containment for gasoline and other hazardous material storage in the maintenance shed.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ When feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Continue to prohibit public access to the wells by locking gates and posting signs.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Never use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane or natural gas for back-up power sources.

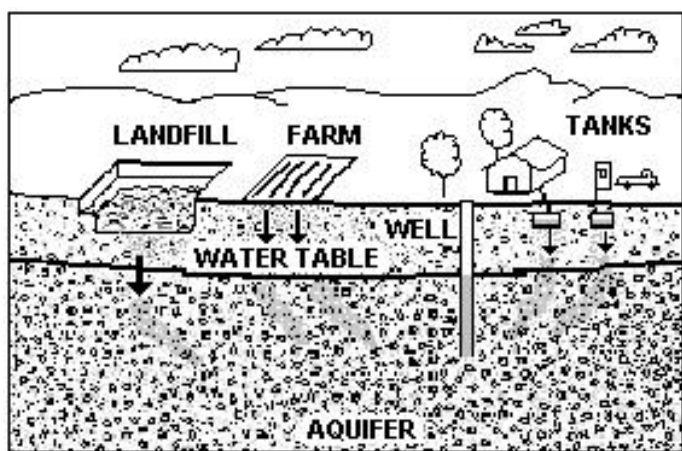


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.

Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Atrium Nursing Home

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Atrium Nursing Home
PWS Address	314 Marion Road
City/Town	Middleborough, Massachusetts 02346
PWS ID Number	4182015
Local Contact	Marsha Macinnis/ Robert J Bouchard (operator)
Phone Number	(508) 947-8632/(508) 946-1394

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4182015-01G	359	1600	Moderate
Well #2	4182015-02G	326	1120	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Atrium Nursing Home receives its water from two groundwater wells located in a forested area south of the facility. Well #1 has a Zone I of 359 feet and an Interim Wellhead Protection Area (IWPA) of 1600 feet. Well #2 has a Zone I of 326 feet and an Interim Wellhead Protection Area (IWPA) of 1120 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs.

The wells serving the facility do not require treatment at this time. The DEP requires

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Zone I;**
2. **Above ground storage tanks;**
3. **Agricultural activities;**
4. **Wastewater and septic systems, and;**
5. **Road.**

The overall ranking of susceptibility to contamination for the wells is Moderate, based on the presence of Moderate threats within the IWPA.

1. **Zone Is** – Currently, the wells meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I contains only activities related to the water supply. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep non-water supply activities out of Zone I.

2. **Aboveground Storage Tanks (AST)** – There are two ASTs containing diesel fuel located within the IWPA. If managed improperly, above ground storage tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Agricultural activities	No	Yes	Moderate	Microbial and Non-microbial contamination related to farming (manure, pesticides and fertilizers)
Nursing Homes (three)	No	Yes	Low	Microbial, pharmaceutical and operational contaminants: improper management
Lawn	No	Yes	Moderate	fertilizer and pesticide use
Above ground storage tank	No	Yes	Moderate	leaks, spills
Wastewater and septic system	No	Yes	Moderate	bacteria, improper disposal of hazardous materials
Road	No	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

liquid volume, should a spill occur.

- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. **Agricultural activities** – Cows, horses and chickens are kept within the IWPA. Forestry operations take place within the predominantly forested IWPA. Both of these activities have a potential to impact water quality.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

4. **Wastewater and septic systems** – Wastewater and septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of hazardous materials to wastewater and septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent hazardous materials. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems. Avoid septic tank cleaners, especially those with acids and solvents.
- ✓ Educate private septic system owners on proper septic system maintenance and operation.

5. **Road** – Part of Marion Road is within the edge of the IWPA. Runoff and spills from

roads can contaminate public wells.

Recommendation:

- ✓ Maintain contact with the Fire Department and local Department of Public Works about spills and activities on the road.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Atrium Nursing Home is commended for protection of the entire Zone I for the facility's drinking water. The facility should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

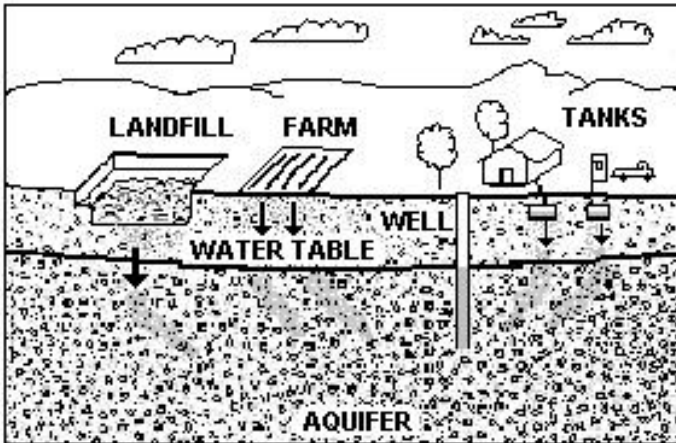


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Properly manage road and parking lot stormwater drainage in IWPA, include drainage maps in your emergency plan for the water supply.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Construct, inspect and maintain the integrity of a containment structure for the ASTs.
- ✓ Wastewater and septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in an Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

6. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Woods Pond Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
February 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Woods Pond Condominiums
PWS Address	1 King's Way
City/Town	Middleborough
PWS ID Number	4182016
Local Contact	David Connolly/Robert Bouchard (Certified Operator)
Phone Number	(508) 923-0420/(508) 946-1394

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	160	478	High
Well #2	02G	160	478	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for the Woods Pond Condominiums are located in a forested area south of the cabins. The wells have Zone Is of 160 feet and an Interim Wellhead Protection Areas (IWPA) of 478 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPA.

The wells serving the facility have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **activities in Zone Is;**
2. **cranberry bogs;**
3. **cesspools and septic systems; and**
4. **vehicle parking and roads.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of a threat with a high ranking within the IWPA.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. Woods Pond Condominiums should be commended for owning the Zone Is for its wells, however, the Zone Is contain three cabins. According to the 2002 Annual statistics report for Woods Pond Condominiums one cesspool is located on the edge of the Zone Is, this is a violation of The State Environmental Code, Title 5 (310 CMR 15.303(1)(b)). Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove the cesspool from the Zone Is.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.
2. **Cranberry Bogs** – A cranberry bog is within the IWPA. If improperly stored, applied, or disposed pesticides and fertilizers have the potential to contaminate drinking water sources.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Cesspool in Zone I	Yes	Yes	High	Bacteria, improper disposal of hazardous materials
Cesspools and septic systems	(see above)	Yes	Moderate	Bacteria, improper disposal of hazardous materials
Cranberry Bogs	No	Yes	High	Pesticides and Fertilizers.
Vehicle Parking and Roads	Yes	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the IWPA maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.
- ✓ Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.

3. **Cesspools and Septic Systems** – All the units are served by cesspools except for one, which has a septic system. Improperly managed cesspools and septic systems are a potential source of chemical and microbiological contamination to groundwater wells.

Recommendation:

- ✓ Educate residents on proper disposal methods for hazardous wastes; never pour them down the drain or on the ground.
- ✓ Septic system components should be inspected and maintained on a regular basis.

4. **Vehicle Parking and Roads** – Leaks, spills and road runoff is a potential threat of contamination to groundwater.

Recommendation:

- ✓ Ensure runoff is directed away from the wells.
- ✓ Continue to maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Woods Pond Condominiums should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Remove cesspool in the Zone Is.
- ✓ Keep additional non-water supply activities out of the Zone Is.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Post water supply protections signs in the Zone Is and IWPAs.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Conduct regular inspections of the Zone Is. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone Is.

Training and Education:

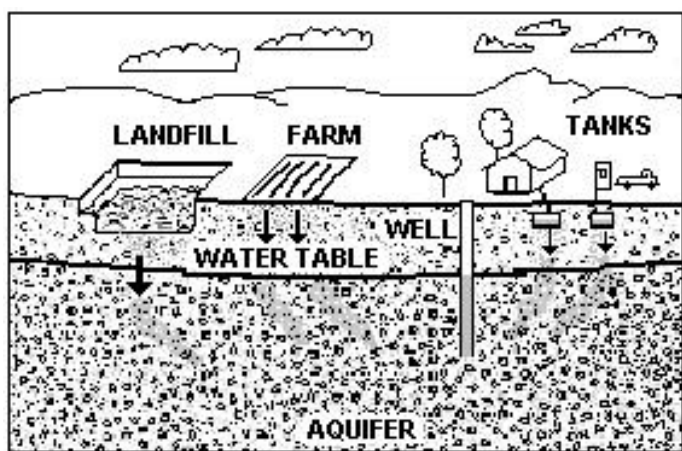


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Educate residents on proper hazardous material use, disposal, emergency response, and best management practices.

Facilities Management:

- ✓ Cesspool and septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include your IWPA in an Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Source Protection Sign Order Form



**Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
AESCO Electronics**

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

**SWAP and
Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
March 2004

Table 1: Public Water System (PWS) Information

PWS NAME	AESCO Electronics
PWS Address	9 Clayton Road
City/Town	Middleborough
PWS ID Number	4182017
Local Contact	Linda Lawson/Frederick Parmenter
Phone Number	508-947-4262/508-947-1070

Well Name	Source ID#	Zone I (in feet)	IWPA	Source Susceptibility
Well #1	4182017-01G	160	456	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

1. Description of the Water System

Well #1 provides a public water supply to AESCO Electronics in Middleborough. The well has a Zone I of 160 feet and an Interim Wellhead Protection Area (IWPA) of 456 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (manufacturing building, access road to plant, parking, storage shed)
2. Route 495, local roads
3. Residences
4. Hay Field

Table 2: Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
manufacturing building, access road to plant, parking	Yes	Yes	H	spills from hazardous materials, wastes and solvents; stormwater runoff from the access road and parking lot
storage shed	Yes	No	H	spills or leaks of gasoline stored in shed
Route 495, local roads	No	adjacent	H	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way; stormwater contaminants; road salt
residences	No	Yes	M	pesticides and fertilizers from lawn care; leaks or spills of automotive fluids; stormwater; microbial contamination from septic systems
hay field	No	Yes	H	over-application or spills of pesticides and fertilizers, grazing animals

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The overall ranking of susceptibility to contamination for the well is HIGH based on the presence of at least one HIGH threat within the Zone I and IWPA.

1. **Zone I**– The public water system owns or controls the Zone I and posts water supply protection signs. The public water system does not meet DEP's Zone I requirements because there are non-water supply activities within the Zone I. The manufacturing facility, parking and an access road are located in the Zone I. There is also a storage shed in the Zone I that contains five gallons of gasoline stored for a lawnmower.

Recommendations

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Do not store gasoline near the well.
- ✓ Do not use pesticides or fertilizers within the Zone I.
- ✓ Do not store, and avoid using, de-icing materials within the Zone I.
- ✓ Work with the Town to direct stormwater away from the well.
- ✓ Use Best Management Practices to handle, store and dispose of hazardous materials and wastes.

2. **Route 495, Local Roads** – Route 495 is adjacent to the IWPA and local roads are located within it. Leaks and spills, vehicular accidents, road salt and over-application or spills of pesticides are potential sources of contamination. In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

3. **Residential** – There are a few residences within the IWPA.

Recommendation

- ✓ Distribute the fact sheet *Residents Protect Drinking Water*.

4. **Hay Field**– There is a hay field located within the IWPA. If pesticides or fertilizers are used or if animals are grazing, the hay field is a potential source of contamination.

Recommendation

- ✓ Talk to the owner about the location of the well and determine if pesticides or fertilizers are used on the field and if animals are present.

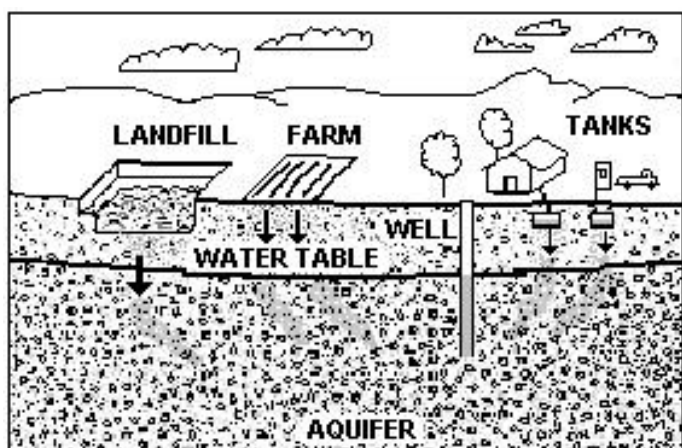


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

3. Recommendations for Protection

Implementing protection measures will reduce susceptibility to contamination.

Priority Recommendations:

Zone I

- ✓ Continue to inspect the Zone I.

Training and Education

- ✓ Educate employees on source protection measures for protecting water supplies. Describe proper use, storage and disposal of materials within the Zone I. See the enclosed *Businesses Protect Drinking Water* fact sheet.

Facilities Management

- ✓ Do not use or store pesticides or fertilizers within the Zone I. Avoid using de-icing materials if possible.

Planning

- ✓ Work with town officials to improve water supply protection.

Funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- *Residents Protect Drinking Water* fact sheet
- *Businesses Protect Drinking Water* fact sheet



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Siasconset Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Siasconset Water Department
<i>PWS Address</i>	Milestone Road
<i>City/Town</i>	Nantucket, Massachusetts 02564
<i>PWS ID Number</i>	4197001
<i>Local Contact</i>	James Chaves
<i>Phone Number</i>	(508) 257-6351

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

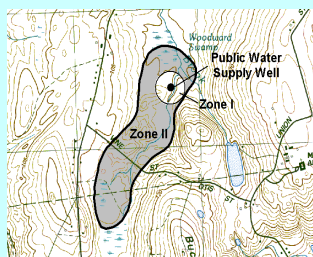
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 23

Susceptibility: High

Well Names	Source IDs
Dug Well #1	4197001-01G
Dug Well #2	4197001-02G
Dug Well #3 & #4	4197001-04G
GP Well	4197001-06G

Siasconset Water Department receives its water from four groundwater wells located in one Zone II recharge area. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

The Siasconset Water Department adds Calciquest (a blended orthophosphate and polyphosphate product) to its water. The polyphosphate component of the product sequesters iron that may be within the water supply, while the orthophosphate component provides the protective coating to the water mains. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Siasconset is dominated by Open Land, Participation Recreation and Pasture land uses with small areas of Residential land use (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Dug Wells #1, #2, #3 and #4 share a Zone I protection area that is not entirely owned or controlled by the water system. The Zone I for the Gravel Packed Well is owned or controlled by the water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Dug Wells #1, #2, #3, and #4 (4197001-01G, -02G & 04G) – There are several residences with septic, a bike path, a baseball diamond and Milestone Road within the Zone I.

Zone I: GP Well (4197001-06G) – A baseball diamond is within the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 16% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common

potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

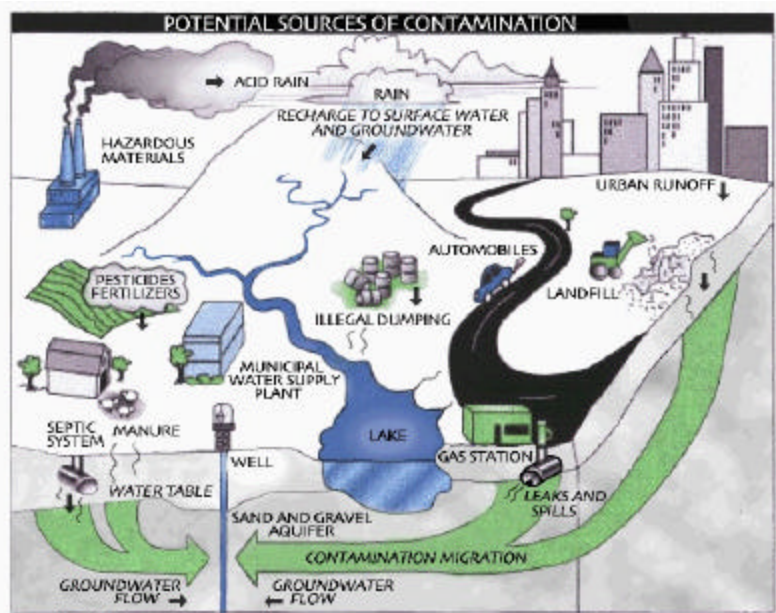
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Modified from © 2000 The Groundwater Foundation. Illustrated by C. Mansfield, The Groundwater Foundation

information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Protection Planning - Currently, Nantucket's water supply protection controls do not incorporate Siasconset's Zone II, however, the water supplier has a Wellhead Protection Plan. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Establish a protection team, and use the team to implement the recommendations of the plan.
- ✓ Coordinate efforts with local officials to incorporate Siasconset's Zone II into Nantucket's local wellhead protection controls that meet current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env>.

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins of DEP's Southeast Regional Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

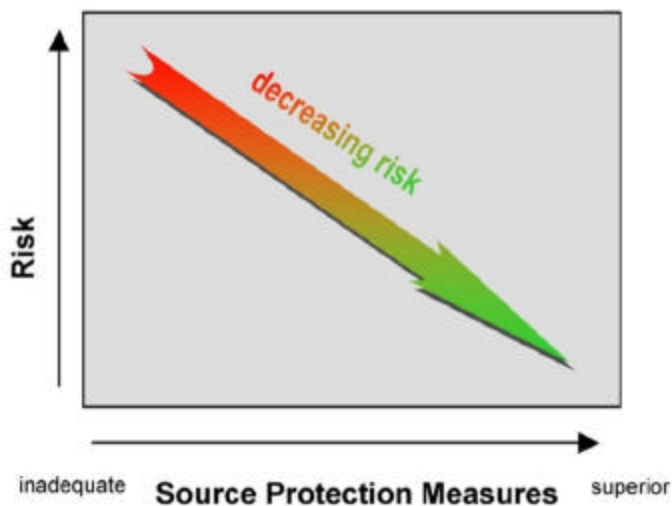


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	2	M	Fertilizers: leaks, spills, improper handling, or over-application (Ballfield/Golfcourse)
Pesticide Storage or Use	2	H	Pesticides: leaks, spills, improper handling, or over-application (Ballfield/Golfcourse)
Commercial			
Golf Courses	1	M	Fertilizers or pesticides: over-application or improper handling
Residential			
Fuel Oil Storage (at residences)	several	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	several	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	several	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aboveground Storage Tanks	few	M	Materials stored in tanks: spills, leaks, or improper handling (includes storage of water treatment chemicals at wellsites)
Aquatic Wildlife	some	L	Microbial contaminants
Stormwater Drains/ Retention Basins	few	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)
state.ma.us/.

Other land uses and activities within the Zone II include a golf course. Refer to Table 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The acquisition of 26 acres for water supply protection purposes.
- Restrictions on use of water supply property that include hunting and recreational vehicles.
- Developing a Wellhead Protection Plan.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents on ways they can help you to protect drinking

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

**When you fertilize the lawn,
Remember
you're not just fertilizing the lawn.**



It's hard to imagine that a green, flourishing lawn could pose a threat to the environment, but the fertilizers you apply to your lawn are potential pollutants. If a spillage, misapplication or excessive fertilization can be washed off your property and end up in lakes and streams, this causes algae to grow, which uses up oxygen that fish need to survive. So if you fertilize, please follow directions and use sparingly.

MASS. SOURCE PROTECTION AND RESTORATION PROGRAM, 100 WATER STREET, BOSTON, MA 02109

**When you wash your car in the
driveway,
Remember
you're not just washing your car in the
driveway.**



All the soap, suds, and oily grime flow by the curb. Then into a storm drain and directly into our lakes, rivers, and streams. And that causes pollution which is unhealthy for everyone. So how do you avoid this whole mess? Easy! Wash your car on the grass or gravel. Or better yet, take it to a car wash where the water gets treated or recycled.

The Mass. Source Protection and Restoration Program, 100 Water Street, Boston, MA 02109

- ✓ water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Establish a Wellhead Protection Committee and implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>. EPA also lists possible funding sources for water quality at <http://www.nalusda.gov/wqic/funding.html>

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection



Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Investigate ownership or control options for residential land uses within the Zone Is.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Encourage Nantucket to expand its wellhead protection controls to include the Siasconset Zone II. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Form a Wellhead Protection Team to implement the recommendations of your Wellhead Protection Plan.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens’ groups, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see “Hazardous Materials Management: A Community's Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	NO	Aim efforts at residential, commercial and municipal uses within the Zone II.

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
No DEP Permitted Facilities were identified during the assessment.					

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No DFS registered Underground Storage Tanks were identified during the assessment.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
No DEP Tier Classified Sites were identified during the assessment.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For King's Grant Water Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
June 2004

Table 1: Public Water System (PWS) Information

PWS NAME	King's Grant Water Company
PWS Address	839 Newport Avenue
City/Town	Attleboro, MA 02703
PWS ID Number	4211001
Local Contact	John Brady
Phone Number	(508) 761-8531

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	347	1392	Moderate
Well #2	02G	347	1392	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

King's Grant Water Company draws its water from a groundwater aquifer in the Blackstone River Basin. King's Grant Water Company has two wells, Well #1 (4211001-01G) is the primary well and Well #2 (4211001-02G) is used as a back-up well. Both Well #1 and Well #2 have Zone Is of 347 feet and IWPA's of 1392 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPA's.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The King's Grant Water Company treats its water with potassium hydroxide for corrosion control. Potassium hydroxide raises the water's pH to non corrosive levels. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **golf course;**
3. **residential development; and**
4. **roads.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate threats within the Zone I and IWPA.

1. **Zone Is** – Currently, the wells do not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. King's Grant Water Company owns 97% of their Zone I, however, on the edge of the Zone I are private residential homes and a small portion of a local road. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Educate private homeowners on source protection issues including septic system maintenance, hazardous materials handling and lawn care.
- ✓ Restrict access to the Zone I area with gates and locks.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Home	Yes	Yes	Moderate	fertilizer, pesticides, septic system and hazardous materials
Golf course	No	Yes	Moderate	fertilizers, pesticides and fuel storage
Residential development	No	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks
Roads	Yes	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Golf Course** – There is a golf course in the northeastern portion of the IWPA. Activities associated with golf courses that are potential threat to drinking water quality include fertilizer and pesticide use and bulk fuel storage. By implementing Best Management Practices (BMPs) the golf course can reduce the potential risk of contaminating water supplies.

✓ Educate the golf course owners about water supply protection topics relating to golf course operation and maintenance. Be sure to include Integrated Pest Management (IPM) information.

3. **Residential Development** – There is medium density residential development within the IWPA.

Recommendation:

✓ Educate residents on drinking water source protection. Include information on landscaping, hazardous materials handling and septic system maintenance.

4. **Roads** – Local roads are common within the IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

✓ Map stormwater drainage within the IWPA and inspect drainage periodically for spill contamination.

✓ Continue to maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. King's Grant Water Company should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

✓ Keep additional non-water supply activities out of the Zone I.

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Provide source protection information to golf course

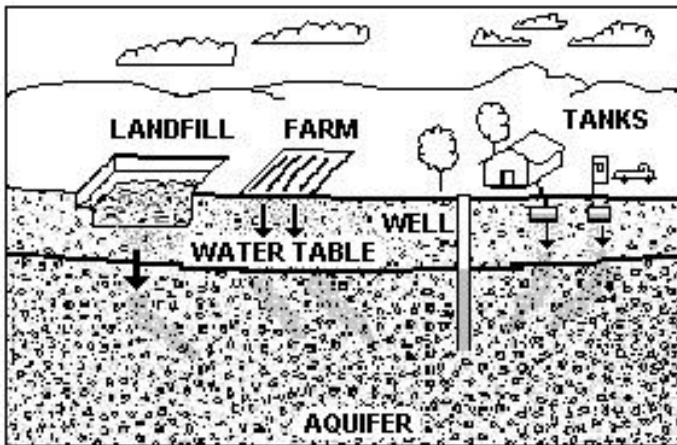


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/ including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

owners.

- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glpgrgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form
- Integrated Pest Management information



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Norton Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Norton Water Department
<i>PWS Address</i>	70 R East Main Street
<i>City/Town</i>	Norton, MA 02766
<i>PWS ID Number</i>	4218000
<i>Local Contact</i>	Duane Knapp
<i>Phone Number</i>	(508) 285-0280

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

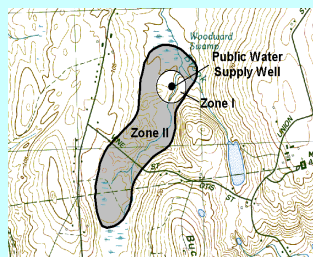
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II or IWPA.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: A 400 foot to ½ mile radius around a water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II.

Section 1: Description of the Water System

Zone II #: 240

Susceptibility: High

Well Names	Source IDs
GP Well #4	4218000-04G
GP Well #5	4218000-05G
GP Well #6	4218000-06G

Zone II #: 241

Susceptibility: High

Well Names	Source IDs
GP Well #3	4218000-03G

Zone II #: 325

Susceptibility: High

Well Names	Source IDs
GP Well #1 Pine St	4218000-01G

IWPA

Susceptibility: High

Well Names	Source IDs
GP Well #2 - inactive	4218000-02G

The 5 active wells for the Norton Water Department are located in three Zone II. GP Well #2 (02G) is an inactive well with an Interim Wellhead Protection Area (IWPA). Each well has a Zone I of 400 feet. Zone II # 240 for Well #4, #5, and #6 extends in to the Town of Easton, and Zone II #325 for Well #1 extends in to the Town of Mansfield. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Wells #5, #6, and #3 are under investigation as to whether they are under the direct influence of surface water (GWUDI). If the wells are determined to be GWUDI sources, the water supplier should inventory land uses and investigate source protection options within the Zone III. Please refer to the attached map to view the boundaries of the Zone II and IWPA.

The active wells have potassium hydroxide added for corrosion control, and have sodium hypochlorite added as a disinfectant. Wells #3, #4, #5, and #6 are treated to remove iron and manganese. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and IWPA for Norton are largely a mixture of forested and residential land uses, with small areas of commercial and industrial land uses

(refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the six wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone I for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land uses are common throughout the protection areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to

septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

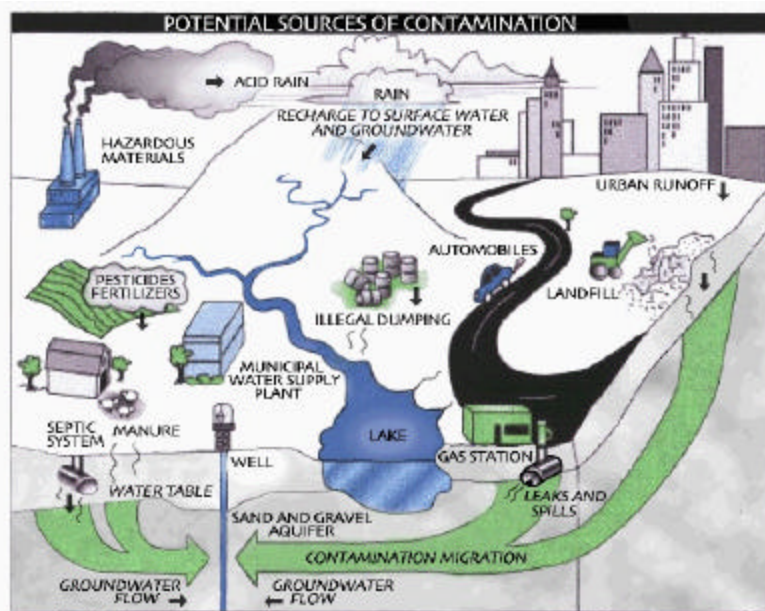
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Interstate I-495 runs through Zone II #240 just south of the wells. Local roads are common throughout the Zone II and IWPA. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – The Zone II and IWPA contain commercial land uses. Many small businesses and facilities use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies.

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

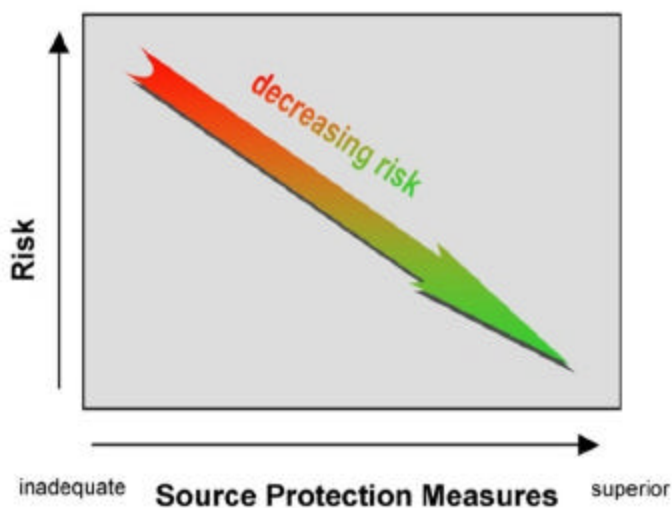


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Agricultural				
Livestock Operations	2	M	All	Manure (microbial contaminants): improper handling
Manure Storage or Spreading	1	H	All	Manure (microbial contaminants): improper handling
Pesticide Storage or Use	1	H	#240	Pesticides: leaks, spills, improper handling, or over-application. Note Cranberry bogs.
Commercial				
Cemeteries	1	M	#240	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Nursing Homes	1	L	#241	Microbial contaminants: improper management
Residential				
Lawn Care / Gardening	50+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	50+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Composting Facilities	1	L	#241	Organic material, animal waste, and runoff: storage and improper handling
Road And Maintenance Depots	1	M	#240	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Many	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	1	M	#240	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling. Note: I-495.

* See Table 2 Notes on Page 9.

Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0015168, 400115211, 4 0013785, 4-0015212, 4-0001313, and 4-0000370. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are cranberry bogs and livestock operations in the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

7. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Continue to work with neighboring towns to protect the system Zone II areas that extend in to those towns.
- ✓ Keep your Wellhead Protection Plan up to date. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Refer to Table 2 and Appendix 2 for more information about the land uses within

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Keep new non-water supply activities away from Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	SOME	Continue to work with Mansfield and Easton to protect the Zone IIs.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	When updating your plan, follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, agricultural and municipal uses within the Zone II.

the water supply protection areas.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II and IWPA contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Active inspections by the Board of Health of facilities that might use hazardous materials.
- Local regulation of Underground Storage Tanks.
- Purchasing land within the Zone II and removing threatening land uses from the Zone II.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to work with neighboring towns to protect the system Zone II areas that extend in to those towns.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and IWPA and to cooperate on responding to spills or accidents.
- ✓ Partner with Zone II businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Table 2 (Page 5) Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS**DEP Permitted Facilities**

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
32396	Golden Automotive Repair	496 Foundry St.	Easton	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
133913	C&J Maplewood Auto Center Inc.	490 Foundry St.	Easton	FULDSP	FULDSP	Fuel Dispenser
367977	Mobil 11828 ExxonMobil Oil Corp.	491 Foundry St.	Easton	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
			Easton	FULDSP	FULDSP	Fuel Dispenser
34184	Mansfield Body Shop	1004 East St	Mansfield	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
37594	Mansfield Department of Public Works	500 East St., Rt. 106	Mansfield	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
39454	Mansfield Landfill	East St., Rt. 106	Mansfield	SLF	CLF	Closed Landfill

Continued on following page.

APPENDIX A Continued: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS**Underground Storage Tanks**

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
MOBIL #A3J ID #19180	491 FOUNDRY ST	EASTON	Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
			Reinforced	1 Wall	A	10000	Gasoline
MANSFIELD DPW HIGHWAY GARAGE	500 EAST ST	MANSFIELD	Reinforced	2 Walls	I	6000	Gasoline
ID #3330			Reinforced	2 Walls	I	6000	Gasoline
			Reinforced	2 Walls	I	2500	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0015168	500 EAST ST	MANSFIELD	Hazardous Material
4-0015211	50 EAST ST	MANSFIELD	Oil
4-0013785	842 EAST ST	MANSFIELD	Oil
4-0015212	8 SHANNON LANE	MANSFIELD	Oil
4-0001313	308 E MAIN ST	NORTON	Hazardous Material
4-0000370	491 FOUNDRY STREET	EASTON	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Norwell Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Norwell Water Department
<i>PWS Address</i>	345 Main Street
<i>City/Town</i>	Norwell, Massachusetts
<i>PWS ID Number</i>	4219000
<i>Local Contact</i>	John McInnis
<i>Phone Number</i>	(781) 659-8076

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

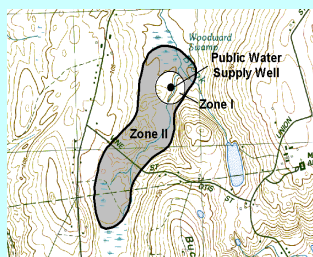
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 255

Susceptibility: High

Well Names	Source IDs
South Street Well #1	4219000-01G
South Street Well #6	4219000-06G

Zone II #: 536

Susceptibility: High

Well Names	Source IDs
GP Well #4	4219000-04G
GP Well #7	4219000-08G
GP Well #8	4219000-09G

Zone II #: 537

Susceptibility: Moderate

Well Names	Source IDs
GP Well #9	4219000-10G

Zone II #: 238

Susceptibility: High

Well Names	Source IDs
Grove St. Well # 2	4219000-02G
Grove St. Well # 3	4219000-03G
Grove St. Well # 5	4219000-05G
Grove St. Well # 10	4219000-11G

The Norwell Water Department receives all of its water from ten groundwater wells located in four Zone II recharge areas (see above table). The wells are located in Norwell, however, the recharge areas do extend into the neighboring communities of Hingham and Hanover. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs. Please note that Norwell is in the process of developing a new groundwater source, Well #11, located in the South Street Wellfield. An assessment of the recharge area for this source is not included in this report.

Water from all of Norwell's wells receives some form of treatment. Wells #1 and #6 are filtered to remove iron, manganese and organic color; further treatment for pH adjustment and disinfection are achieved through potassium hydroxide and chlorine addition. Wells #2, #3, #4, #5, #7, and #10 also receive pH adjustment and disinfection with potassium hydroxide and chlorine addition. Well #9 is used infrequently due to limited production capacity, when in use it is disinfected with chlorine. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Norwell are dominated by a mixture of forest and residential land uses with small areas of commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The ten Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Well #1 4219000-01G – South Street intersects the Zone I, running within about fifty feet of the wellhead.

Zone I: Well #7 4219000-08G and Well #8 4219000-09G – Washington Street (Rt. 53) intersects the Zone Is, about 290 feet from Well #7 and 360 feet from Well #8.

Zone I Recommendations:

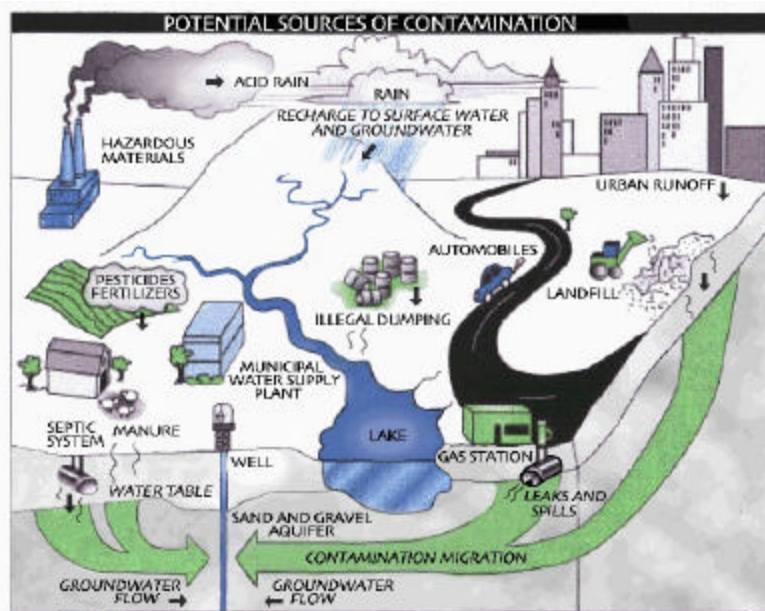
- ✓ If possible redirect roadway stormwater drainage out of Zone Is and away from wellheads.
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



2. Residential Land Uses – Residential areas are common throughout the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

[state.ma.us/dep/brp/wm/nonpoint.htm](http://www.state.ma.us/dep/brp/wm/nonpoint.htm).

3. Transportation Corridors - Route 3 runs through the Zone II for Wells # 1 and # 6 and the Zone II for Wells #4, #7 and #8. Route 53 runs through the Zone IIs for all of the wells except for Well #9. Local roads are common throughout all the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

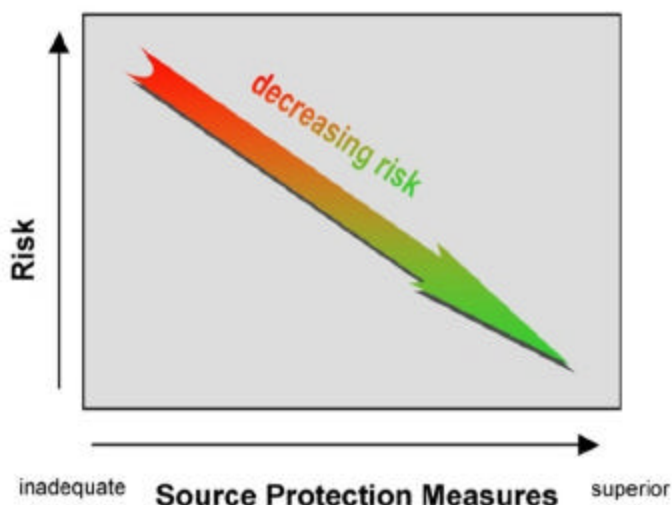


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	#255	Fertilizers: leaks, spills, improper handling, or over-application (Old Red Cider Mill)
Commercial				
Cemeteries	1	M	#537	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	1	H	#255	Solvents and wastes: spills, leaks, or improper handling
Medical Facilities	1	M	#536	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (Dentist)
Nursing Homes	1	L	#255	Microbial contaminants: improper management
Printer And Blueprint Shops	1	M	#255	Printing inks and chemicals: spills, leaks, or improper handling or storage (Printer)
Repair Shops (Engine, Appliances, Etc.)	1	H	#536	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	100+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	100+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	100+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Some	L	All	Microbial contaminants
Fire Training Facilities	1	M	#536	Fuels and other chemicals: improper use or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Miscellaneous Continued				
Oil or Hazardous Material Sites	3	--	#255 & #536	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Stormwater Drains/ Retention Basins	Several	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	Several	M	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling (Rt. 3, Rt. 53 and local roads)
Underground Storage Tanks	Several	H	All	Stored materials: spills, leaks, or improper handling (Residential and one commercial in Zone II #255)
Very Small Quantity Hazardous Waste Generator	1	L	#536	Hazardous materials and waste: spills, leaks, or improper handling or storage
Water Treatment Sludge Lagoon	2	M	#255	Sludge and wastewater: improper management (Norwell and Hanover Water Departments)
<p>Table 2 Notes:</p> <ol style="list-style-type: none"> 1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. 2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. 3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

(Continued from page 4)

aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use— Small areas of the Zone II and IWPA are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. . Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly

(Continued on page 7)

(Continued from page 6)

stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0011269 and 4-0001341. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, Norwell has local Wellhead Protection controls to protect drinking water sources, but DEP has not reviewed the controls to verify that they meet the requirements of 310 CMR 22.21(2). In order to receive a DEP review, Norwell would need to submit copies of their approved bylaws and aquifer protection bylaw district overlay maps to DEP. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs’ community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include printers, dry cleaners and engine repair shops. Refer to Table 2 and Appendix A for more information about these land uses.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone Is?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES/NO	Continue monitoring non-water supply activities (South Street and Washington Street) in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES/NO	Norwell has passed an "Aquifer Protection District" bylaw, however, it has not been reviewed by DEP to ensure that it meets the requirements of 310 CMR 22.21(2).
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with Hanover and Hingham on reciprocal source protection controls across town boundaries.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The acquisition of most of the land in the Zone II for the new source, future Well #11.
- Working with the Town of Hingham on source protection issues relating to Wells #2 and #10.
- Protection of all the Zone I areas in the Town of Norwell.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone Is regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop a Wellhead Protection Plan.
- ✓ Establish a Wellhead Protection Committee to implement goals of Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A:

REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
29011	MACDONALD MOTOR SERVICE	212 WASHINGTON STREET	NORWELL	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste
312417	GARRISON HOUSE PRESS	295 WASHINGTON STREET	NORWELL	HANDLR	VSQG	Very Small Quantity Generator of Hazardous Waste

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No DFS registered tanks identified during assessment							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000524	271 WASHINGTON ST	NORWELL	Oil and Hazardous Materials
4-0011269	32 GLN TRLR PARK	NORWELL	Oil
4-0001341	962 WASHINGTON ST	HANSON	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Oak Bluffs Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Oak Bluffs Water District
<i>PWS Address</i>	96 Vineyard Avenue
<i>City/Town</i>	Oak Bluffs, Massachusetts
<i>PWS ID Number</i>	4221000
<i>Local Contact</i>	Deacon Perrotta
<i>Phone Number</i>	(508) 693-5527

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

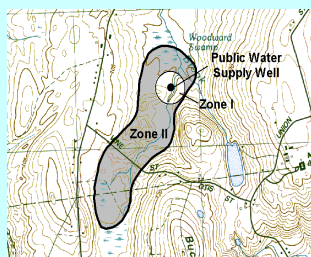
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 212

Susceptibility: High

Well Names	Source IDs
Well #2 Farm Neck Road	4221000-02G

Zone II #: 571

Susceptibility: High

Well Names	Source IDs
Well #1 Lagoon Pond	4221000-01G
Well #3 State Forest	4221000-03G
Well #4 Madison Alwardt Sr.	4221000-04G

The Oak Bluffs Water District (District) receives its water from four groundwater sources located in two Zone II protection areas extending into Tisbury, Edgartown and West Tisbury (see above tables). Each well has a Zone I of 400 feet. The wells are located in an EPA designated Sole Source Aquifer, which is defined as the sole or principal source of drinking water for a given aquifer area which is needed to supply 50% or more of the drinking water for that area and for which there are no reasonably available alternative sources should the aquifer become contaminated. Therefore, Oak Bluffs groundwater sources are in an aquifer with a high vulnerability to contamination due to its sole source status and the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

Treatment of the water consists of corrosion control, disinfection and fluoridation. The Lagoon Pond well also receives treatment for iron removal. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for the District are primarily a mixture of forested and residential land uses with small areas of recreation and commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Three of the Zone Is are owned or controlled by the public water system. A portion of the Zone I for Farm Neck Well contains residential land uses. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Farm Neck Well 4221000-02G – Residential land use exists in the northeast portion of the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential areas are common throughout the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

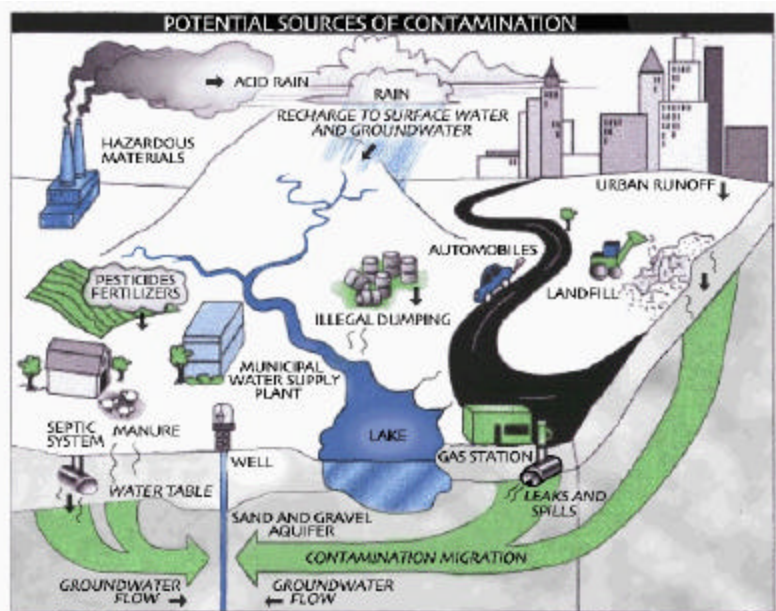
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical roadway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II.

Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use– Even though the land area within the Zone IIs that is used for commercial, industrial or waste disposal purposes is small, the activities associated with these land uses can have significant impacts on water supplies. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

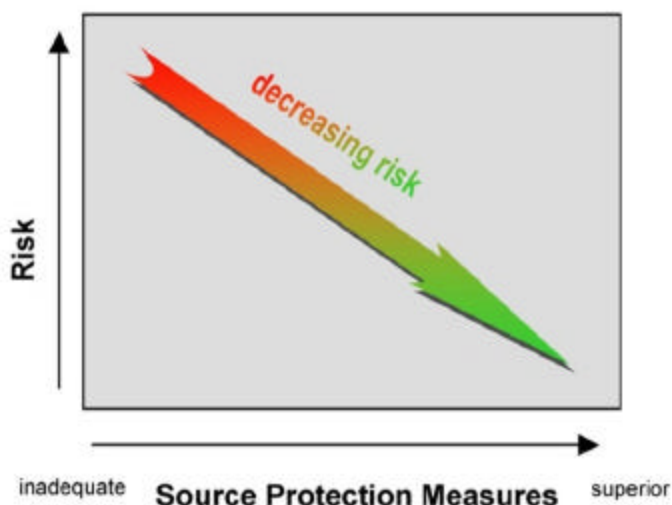


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Livestock Operations	1	M	571	Manure (microbial contaminants): improper handling
Nurseries	1	M	571	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Commercial				
Service Stations/ Auto Repair Shops	1	H	212	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	1	M	212	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	1	M	212	Fertilizers or pesticides: over-application or improper handling
Junk Yards and Salvage Yards	1	H	212	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Sand And Gravel Mining/Washing	1	M	571	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	571	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Industrial Lagoons and Pits	1	H	212	Liquid wastes: improper seepage or overflows
Residential				
Fuel Oil Storage (at residences)	numerous	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Miscellaneous				
Aboveground Storage Tanks	numerous	M	Both	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	few	L	571	Microbial contaminants
Clandestine Dumping	sporadic	H	Both	Debris containing hazardous materials or wastes
Landfills and Dumps	1	H	212	Seepage of leachate
Oil or Hazardous Material Sites	2	--	212	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road And Maintenance Depots	1	M	212	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	2	M	Both	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Waste Transfer/ Recycling Station	1	M	212	Water contacting waste materials: improper management, seepage, and runoff
Wastewater Treatment Plant/Collection Facility/ Lagoon	1	M	212	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management
Very Small Quantity Hazardous Waste Generator	1	L	571	Hazardous materials and waste: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	1	M	212	Hazardous materials and waste: spills, leaks, or improper handling or storage

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II # 212 contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 40011917 and 40014380. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There are agricultural activities including a livestock operation and nursery in Zone II # 571. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.



7. Protection Planning – Currently, the District has worked with the Town to pass water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Use the protection team to implement the goals of the Wellhead Protection Plan for the District, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2) and update local controls when necessary. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES/NO	Pursue Zone I ownership. If ownership is not feasible seek conservation restrictions or Memorandums of Understanding. Educate residents living in Zone Is.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town “Aquifer Protection District” bylaw meets DEP’s requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with neighboring municipalities to include reciprocal wellhead protection controls for all communities on the island.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement the Plan.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Ensure committee includes representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see “Hazardous Materials Management: A Community's Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include auto repair shops, a junkyard, a landfill and mining. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier and Town is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Coordination with the towns on land use planning issues.
- Cooperation by the towns in passing the necessary bylaws to protect the aquifer.
- Strict enforcement of the Title 5 regulations (septic systems) by the local Boards of Health.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Promote further tightening of the current Groundwater Protection Bylaws as recommended by the Vineyard Commission.
- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
39598	Oak Bluffs Landfill	County Road	Oak Bluffs	SLF	LF	Solid Waste Landfill
54487	White Brothers Lynch Corporation	Off Edgartown Road	Oak Bluffs	PLANT	BM450	Air Quality Permit
131170	NSTAR Electric	Edgartown Road	Oak Bluffs	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
228920	BFI Oak Bluffs Browning Ferris Ind.	Pacific Ave.	Oak Bluffs	PLANT	BM 150	Air Quality Permit
271313	Oak Bluffs/Tisbury Solid Waste	Pennsylvania Ave.	Oak Bluffs	TRSTN	LGTRAN	Transfer Station for Toxics

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
FARM NECK GOLF CLUB ID #212	FARM NECK WAY	OAK BLUFFS	Epoxy Coat	2 Walls	Interstitial Monitoring	550	Gasoline
			Epoxy Coat	2 Walls	Interstitial Monitoring	550	Diesel
GOODALE CONST RED HILL PLANT ID #4033	164 EDGARTOWN RD	OAK BLUFFS	Cathodic	2 Walls	Interstitial Monitoring	1000	Gasoline
			Steel	1 Walls	Inventory Recordkeeping	2000	Diesel
OAK BLUFFS GENERATING STATION ID #4030	EDGARTOWN RD	OAK BLUFFS	Cathodic	2 Walls	Interstitial Monitoring	20000	Diesel
			Cathodic	2 Walls	Interstitial Monitoring	20000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0011917	COUNTY RD	OAK BLUFFS	Oil
4-0014380	COUNTY RD	OAK BLUFFS	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Orleans Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Orleans Water Department
<i>PWS Address</i>	19 School Road
<i>City/Town</i>	Orleans, Massachusetts 02653
<i>PWS ID Number</i>	4224000
<i>Local Contact</i>	Charles Medchill
<i>Phone Number</i>	(508) 255-1200

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 161

Susceptibility: High

Well Names	Source IDs
Gould Pond Well #1	4224000-01G
Gould Pond Well #2	4224000-02G
Gould Pond Well #3	4224000-03G
Cliff Pond Well #4	4224000-04G
Cliff Pond Well #5	4224000-05G
Cliff Pond Well #6	4224000-06G
Well #7	4224000-07G

The Town of Orleans has seven groundwater wells located in one Zone II that extends into the Town of Brewster. Wells 1-6 are located on approximately 500 acres of town-owned land off Route 28 and Well #7 is located on approximately 38 acres of town-owned land off Quanset Road. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the locations of the wells, extent of the Zone Is and the boundaries of the Zone II.

All the wells have potassium hydroxide added for corrosion control. To learn more about water quality, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Orleans is predominantly forested, residential and recreational land uses with small areas of commercial, light industrial, mining and waste disposal land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous Materials Storage and Use

The overall ranking of susceptibility to contamination for the system is high, based on the presence of one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The seven

Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Gould Pond Well #1 4224000-01G– The Zone I area acts as a water department parking and includes office activities associated with water supply operations. The building has a wastewater disposal system that includes a septic tank and leachfield.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Avoid parking of vehicles within the Zone Is.
- ✓ Ensure that pesticides, fertilizers and road salt are never stored or used within the Zone Is.
- ✓ Keep any new non water supply activities out of the Zone Is.

2. Residential Land Uses – Approximately 25% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and

Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

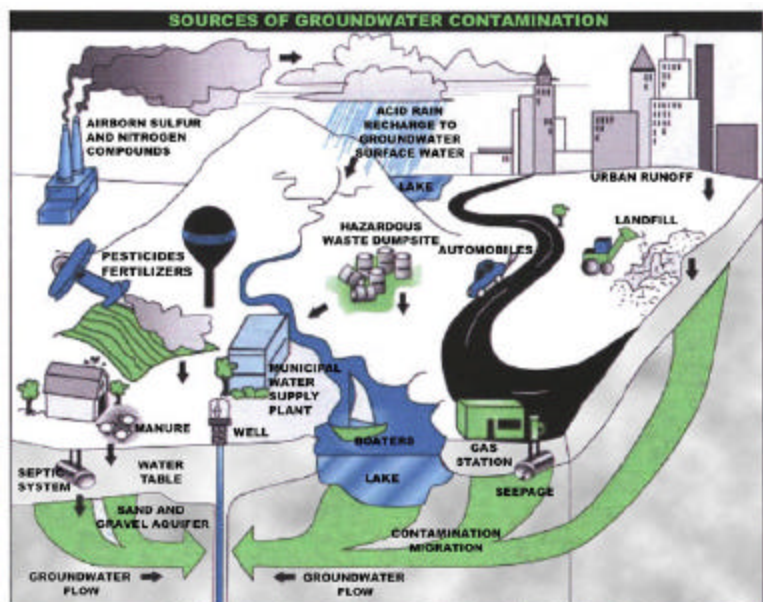
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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“Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 28 intersects the Zone II to the east of the wells, while Route 6 runs through the Zone II along the west side of the wells. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II if possible.
- ✓ Work with the Town and Massachusetts Highway Department to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ Work with the Massachusetts Highway Department and Town to locate accurate storm drainage maps, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – Although only about one percent of the land area within the Zone II is commercial or industrial land use the

activities associated with this land use can have significant impacts on water supplies. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

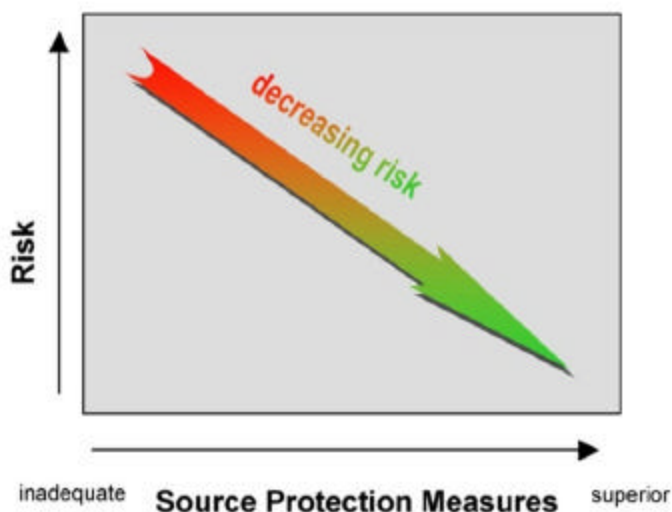


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Use (no storage)	1	M	Fertilizers: leaks, spills, improper handling, or over-application (Playing fields in Brewster)
Pesticide Use (no storage)	1	M	Pesticides: leaks, spills, improper handling, or over-application (Playing fields in Brewster)
Commercial			
Gas Stations/ Service Stations	1	H	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Residential			
Fuel Oil Storage (at residences)	Many	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Many	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Many	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Clandestine Dumping	Infrequent	M	Debris containing hazardous materials or wastes
Transportation Corridors	Many	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Landfills and Dumps	1	M	Untreated tree stumps.

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environ-

(Continued from page 4)

between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

Other land uses and activities within the Zone II are listed in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the Zone II for Orleans contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The town is commended for taking an active role in promoting source protection measures in the Water Supply Protection Area through:

- Purchases of significant parcels of land for water supply protection, which compliments protected open space in Brewster to total 63% protected open space within the Zone II.
- Educating the community about water supply issues through school programs, newsletters, open houses, inserts to water bills and local media.
- The implementation of a proactive Watershed Management Plan.
- Cooperation between local residents and the Water Department to control access and illegal dumping within the protected Zone II areas.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Work with Massachusetts Highway Department to erect water supply protection area signs and accurately map stormwater drainage flows along Route 6 within the Zone II.
- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Continue to implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water

(Continued on page 8)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue to limit the activities within Zone Is to essential water supply activities, when possible remove any threatening activities to other locations.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue cooperation with neighboring communities on source protection issues.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Continue implementing wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Periodically update emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Target additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 6)

source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Appendix A: Standard Protection Recommendations

Land Use	Potential Contaminant Sources*	Recommendation
Agricultural		
Fertilizer Storage or Use	Fertilizers: leaks, spills, improper handling, or over-application	Facility owners/operators to ensure BMPs are in place for proper storage, and application of fertilizers.
Pesticide Storage or Use	Pesticides: leaks, spills, improper handling, or over-application	Facility owners/operators to ensure that BMPs are in place for proper storage, handling, and application of pesticides.
Commercial		
Gas Stations	Automotive fluids and fuels: spills, leaks, or improper handling or storage	Gas stations to ensure BMPs are in place for the proper storage and handling of fuel and automotive fluids.
Sand And Gravel Mining/Washing	Heavy equipment, fuel storage, clandestine dumping: spills or leaks	Sand and gravel operations to ensure that BMPs are in place for fuel storage and the prevention of clandestine dumping.
Residential		
Fuel Oil Storage (at residences)	Fuel oil: spills, leaks, or improper handling	Residents to encourage proper maintenance and upgrades to fuel oil tanks.
Lawn Care / Gardening	Pesticides: over-application or improper storage and disposal	Residents to encourage proper storage, disposal, and application of pesticides.
Septic Systems / Cesspools	Hazardous chemicals: microbial contaminants, and improper disposal	Residents to encourage maintenance and inspection of septic systems and proper disposal of household hazardous waste.
Miscellaneous		
Clandestine Dumping	Debris containing hazardous materials or wastes	Property owners to ensure that BMPs are in place for the inspection of areas prone to clandestine dumping, securing the areas in question, and proper disposal of debris.
Transportation Corridors	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling	Fire department to ensure that emergency response plans consider the water supply protection area.
Stormwater Drains/ Retention Basins	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns	Department of Public Works to ensure that BMPs are in place for the disposal of sludge and maintenance of storm drains and detention basins.

APPENDIX B: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Massachusetts Department of Fire Services - Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
None on record. One Gas Station is located in the Zone II near Cliff Pond Well #5							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Pembroke Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Pembroke Water Department
<i>PWS Address</i>	100 Center Street
<i>City/Town</i>	Pembroke, MA 02359
<i>PWS ID Number</i>	4231000
<i>Local Contact</i>	Michael F. Valenti
<i>Phone Number</i>	(781) 293-3874

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

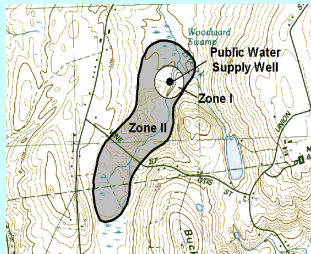
This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Zone II #: 345

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
Hobomock Well (GP Well #1)	4231000-01G
Center Street Well (GP Well #2)	4231000-02G
School Street Well (GP Well #3)	4231000-03G
Bryantville Well (GP Well #4)	4231000-04G
Windswept Bogs Well (GP Well #5)	4231000-05G
<i>Purchased Sources</i>	
<i>Supplier Name</i>	<i>Purchase ID</i>
Marshfield Water Department	4231000-01P
Halifax Water Department	4231000-02P
Abington/Rockland Joint Water Works	4231000-04P

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

The Pembroke Water Department uses five groundwater wells (listed above) to supply drinking water to its customers. Each well has a Zone I of 400 feet and all five wells are located in a single Zone II. The Zone II is largely located in Pembroke, with areas extending in to the Town of Hanson. The aquifer in which the wells are located is considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone II.

Pembroke Water Department also purchases some of its water from the purchased sources listed in the table above. Please, see the appendices for copies of the SWAP reports for each of these source providers.

Pembroke's water receives treatment before entering the distribution system. Wells #1-4 are treated with potassium hydroxide for corrosion control and calcium hypochlorite for disinfection. There is additional treatment at Hobomock Well (GP Well #1) and the Bryantville Well (GP Well #4) to remove iron and manganese. Well #5 is not treated at its source but a transmission line carries the untreated water from well #5 to well #4 where treatment takes place. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Pembroke is dominated by forest, residential, open water and woody perennial land uses. There are also small areas of commercial and light industrial land uses within Pembroke's Zone II. Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail

provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination site
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. Pembroke does not own or control all of their Zone Is, areas of the Zone Is for Hobomock Well (GP Well #1) and Center Street Well (GP Well #2) contain privately owned residential land. However, it is important to recognize that that the Town has complete control of the Zone I of well five. This well is the newest well and was developed and permitted in year 2000. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Center Street Well (GP Well #2) 4231000-02G – The Zone I for Center Street Well is intersected by Route 36 and contains a private residence with an on-site septic system. There is an above ground storage tank at the wellhead containing fuel for a backup power generator.

Zone I: School Street Well (GP Well #3) 4231000-03G – The Zone I for School Street Well is intersected by Route 27.

Zone I: Windswept Bogs Well (GP Well #5) 4231000-05G - Periodic unauthorized access by dirt bikes within the Zone I.

Zone I Recommendations:

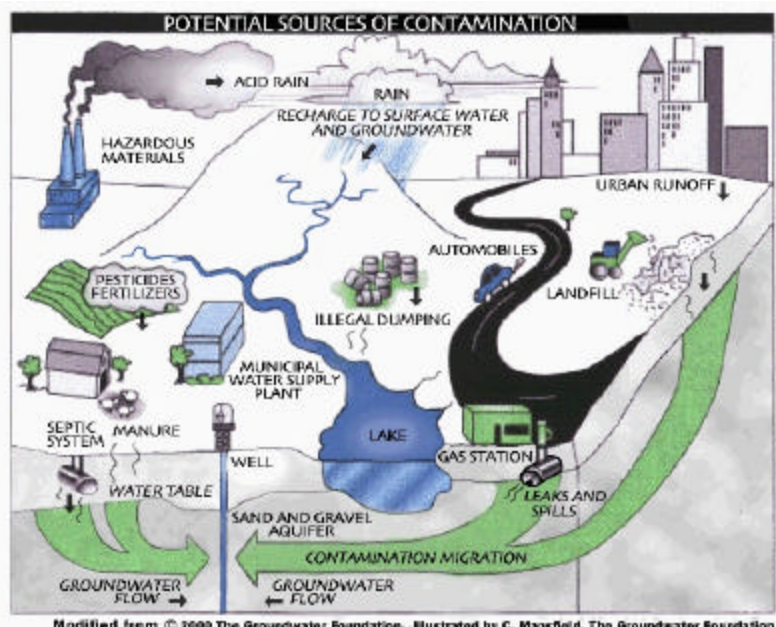
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ When feasible direct stormwater discharges outside of Zone Is.
- ✓ Convert all back-up power supplies at wellheads to propane.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Educate residents living within Zone Is about proper septic system operation and maintenance.
- ✓ Do not use or store pesticides,

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



- ✓ fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 36% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors – Route 14, Route 27 and Route 36 run through the Zone II and local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

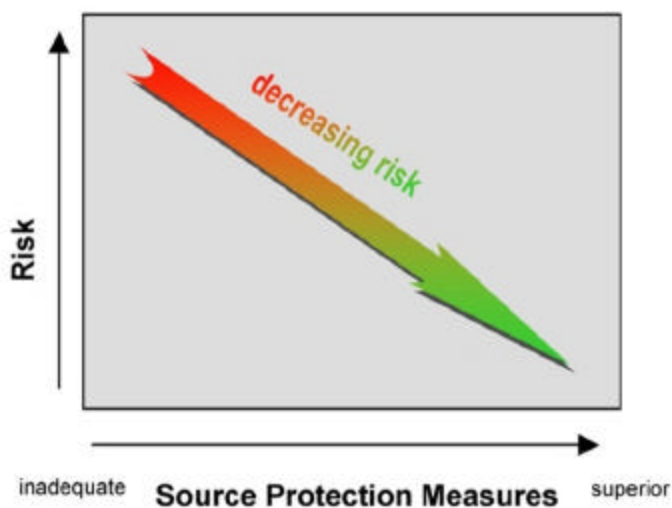


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	several	M	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	several	H	Pesticides: leaks, spills, improper handling, or over-application
Commercial			
Cemeteries	1	M	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	1	M	Fertilizers or pesticides: over-application or improper handling
Residential			
Fuel Oil Storage (at residences)	numerous	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aboveground Storage Tanks	1	M	Materials stored in tanks: spills, leaks, or improper handling (DPW)
Aquatic Wildlife	few	L	Microbial contaminants
Fishing/Boating	few	L	Fuel and other chemical spills, microbial contaminants (2 of 4 ponds)
Landfills and Dumps	1	H	Seepage of leachate (Rt 27, very southern edge of Zone II)
Road And Maintenance Depots	1	M	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage (DPW)
Stormwater Drains/ Retention Basins	numerous	L	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: electric	1	L	Corridor maintenance pesticides: over-application or improper handling; construction

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Miscellaneous: Continued			
Transportation Corridors	several	M	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Oil or Hazardous Material Sites	1	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Water Treatment Sludge Lagoon		M	Sludge and wastewater: improper management
Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>			

(Continued from page 4)

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. Hazardous Materials Storage and Use – Although less than one percent of the land area within the Zone II is commercial or industrial land use, the activities associated with this land use can have significant impacts on water supplies. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water

- ✓ protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Site – The Zone II contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40011554. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – Numerous cranberry bogs are located within the Zone II and Zone I for the Windswept Bogs Well. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Continue enforcement of Pembroke’s bylaw regulating manure storage and spreading.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, Pembroke has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. Pembroke has a Wellhead Protection Plan. There are resources available to help communities develop, update and implement plans for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Establish a wellhead protection committee and use the committee to implement your wellhead protection plan.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2).
- ✓ Assist the local Board of Health with compliance inspection of Pembroke’s floordrain regulation.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	In the future remove all non-water supply activities when feasible.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with Hanson to include Zone II in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update plan as needed in future.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community. Use committee to implement recommendations of Wellhead Protection Plan.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

Other land uses and activities within the Zone II include a road maintenance depot, transmission line and a golf course. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The adoption of bylaws and health regulations that meet DEP's source protection regulations (310CMR 22.21(2)).
- Protection of wellheads and Zone Is with gates, silent alarms and police patrols.
- Implementation and enforcement of Pembroke's Water Use Restriction Bylaw.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue Zone I inspections regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Convene a Wellhead Protection Committee to implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
375025	Pembroke DPW	387 Mattakeesett St.	Pembroke	FULDSP	FULDSP	Fuel Dispenser

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
None Identified							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0011554	38 LIANE LN	PEMBROKE	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Plainville Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Plainville Water Department
<i>PWS Address</i>	17 East Bacon Street
<i>City/Town</i>	Plainville
<i>PWS ID Number</i>	4238000
<i>Local Contact</i>	James Marshall
<i>Phone Number</i>	(508) 695-6871

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

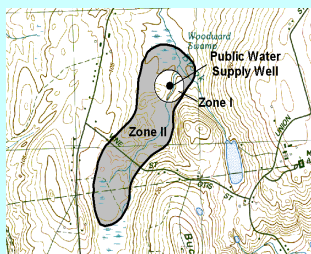
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 495

Susceptibility: High

Well Names	Source IDs
Well #3	4238000-03G

Zone II #: 496

Susceptibility: High

Well Names	Source IDs
Well #1	4238000-01G
Well #2	4238000-02G
Well #5	4238000-05G

Plainville Water Department owns four drinking water wells, though currently only three wells are being used. All of the wells have a Zone I radius of 400 ft. The three wells that are currently operating are all located near the west shoreline of Turnpike Lake between East Bacon Street and George Street and share one Zone II recharge area. Well #2 is considered to be producing groundwater under the direct influence of surface water (GWUDI).

A GWUDI well is one for which a significant percentage of the water drawn from the well is considered to be induced flow from surface water bodies (streams, rivers, ponds, and wetlands). A GWUDI source could potentially be impacted by contaminants that are transported by surface water features and surface water run-off located within the entire Zone III. Therefore, in addition to the Zone II area, land uses within the remainder of the Zone III are also addressed in this report. See the attached map, which include the Zone III boundary.

Well # 3, which is located on West Bacon Street near the Plainville Highway Department, is offline due to groundwater contamination. This well will return to service when a treatment plant is completed. The Zone II for Well #3 will be assessed as part of this report. All of the wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is, Zone IIs and Zone III.

The three active wells are pumped to the Turnpike Lake Well Water Treatment Plant to remove iron and manganese; adjust the pH for corrosion control; and add chlorine for disinfection. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Plainville are a mixture of land uses including forest, residential, commercial, industrial and small areas of sand and gravel mining (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The four Zone Is for the wells are owned or controlled by the public water system and meet DEP's Zone I requirements

Zone I Recommendations:

- ✓ Keep all non water supply activities out of the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Ensure that pesticides, fertilizers or road salt are not used or stored within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.
- ✓ Continue regular inspections of Zone I areas.

2. Residential Land Uses – Approximately 18% of the Zone IIs consist of residential areas. Approximately 10% of the protection areas have public sewers, and so the remaining areas use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to

septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

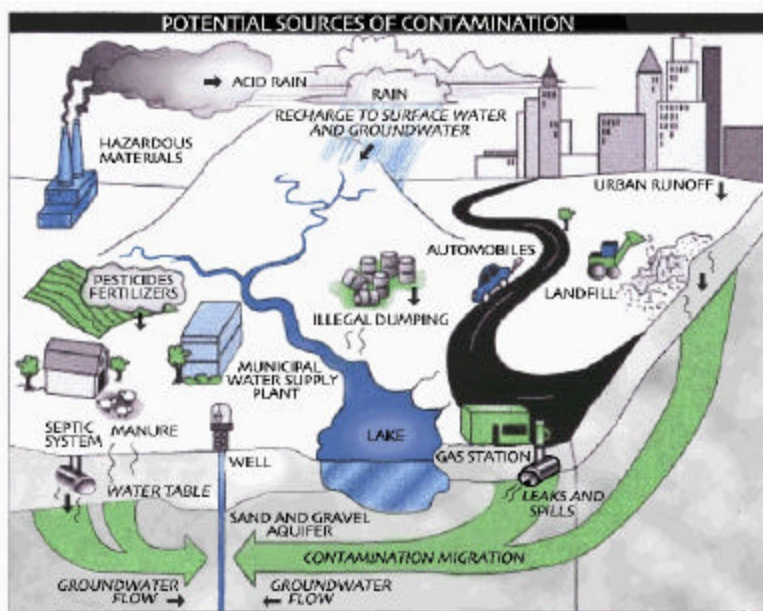
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 1 intersects the Zone II for Wells #1,2 &5 and Route 1A intersects the Zone II for Well #3. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.

- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Ten percent of the land area within the Zone IIs is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

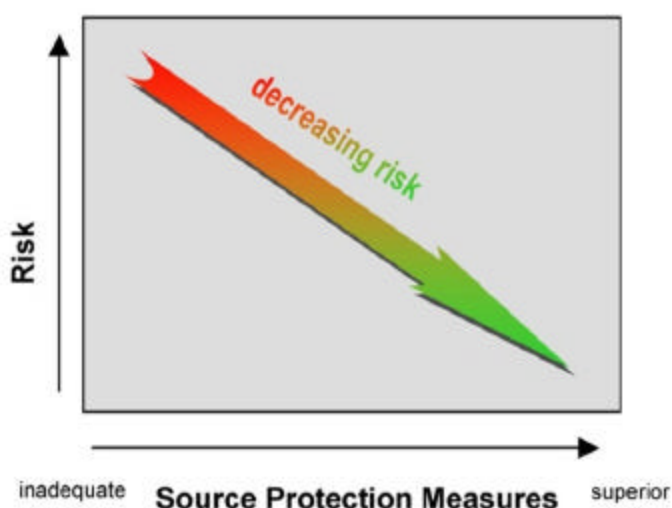


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Commercial				
Car/Truck/Bus Washes	1	L	496	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	2	H	496	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Cemeteries	5	M	495 & 496	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	1	H	496	Solvents and wastes: spills, leaks, or improper handling
Laundromats	2	L	495 & 496	Wash water: improper management
Medical Facilities	5	M	496	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Printer And Blueprint Shops	2	M	495 & 496	Printing inks and chemicals: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	9	H	495 & 496	Automotive fluids and solvents: spills, leaks, or improper handling
Sand And Gravel Mining/Washing	1	M	495	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Electronics/ Electrical Manufacturers	1	H	496	Chemicals and process wastes: spills, leaks, or improper handling or storage
Electroplaters	1	H	496	Solvents and other chemicals: spills, leaks, or improper handling or storage
Petroleum Storage Facilities / Fossil Fuel Power Plants	1	H	495	Petroleum products and equipment maintenance chemicals: spills, leaks, or improper handling or storage
Plastic Manufacturers	1	H	496	Solvents, resins and process wastes: spills, leaks, or improper handling or storage
Fuel Oil Distributors	1	H	495	Fuel oil: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	many	M	495 & 496	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	many	M	495 & 496	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	many	M	495 & 496	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Composting Facilities	1	L	495	Organic material, animal waste, and runoff: storage and improper handling
Landfills and Dumps	1	H	496	Seepage of leachate
Stormwater Drains/ Retention	several	L	495 & 496	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Underground Storage Tanks	6	H	496	Stored materials: spills, leaks, or improper handling
Schools, Colleges, and Universities	3	M	495 & 496	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	10	--	495 & 496	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Transmission Line Rights-of-Way - Type: Power Line	1	L	496	Corridor maintenance pesticides: over-application or improper handling; construction

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0000874, 4-0001226, 4-0001227, 4-0001295, 4-0010132, 4-0012768, 4-0012770, 4-0014395. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2), however, the information has not been provided to the DEP. Plainville should develop a Wellhead protection Plan. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to ensure local wellhead protection controls meet current MA Wellhead Protection Regulations 310 CMR 22.21

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities to note within the Zone II include auto repair shops, gas stations, sand and gravel mining, electroplaters, dry cleaners and bulk fuel oil storage. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's best efforts for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	NO	Use wellhead protection committee to develop wellhead protection for Plainville.

(Continued from page 7)
protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Plainville's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Adopting local bylaws to protect the Zone IIs.
- Using State Revolving Fund money to delineate Zone II protection areas for all of Plainville's sources of drinking water.
- Owning and controlling the Zone Is around each of the system's wells.
- Inspecting the Zone Is regularly.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Convene a Wellhead Protection Committee with members representing local government, businesses, citizen's groups, the water department and other stakeholders.
- ✓ The water department should be a partner in the Phase II Stormwater Rule planning for Plainville.
- ✓ Use the buildout analysis for Plainville to identify critical land for water supply protection. To view buildout maps for Plainville, visit EOE's website at http://commpres.env.state.ma.us/community/cmty_main.asp?communityID=238#Absolute
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Fac#	Facility Name	Street	Town	RO#	Old Sys ID	Phone	Type	Class	SWAP Description
27439	ATCO PLASTICS INC	31 W BACON ST	PLAINVILLE	154971	MAD001463306	(508) 695-3573	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
29965	T&D AUTO TRUCK SERVICE CENTER	160 SOUTH ST	PLAINVILLE	156246	MAD058060112	(508) 695-7169	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
32673	MINI SYSTEMS INC	168 E BACON ST	PLAINVILLE	157549	MAD980670756	(508) 695-2000	HANDLR	SQG	Small Quantity Generator of Haz Waste
				163152	1200357	(508) 695-2000	PLANT	BM150	Air Quality Permit
34598	PLAINVILLE CORP	CROSS ST	PLAINVILLE	158551	MAD981211196	(508) 695-3252	HANDLR	SQG	Small Quantity Generator of Haz Waste
36846	PLAINVILLE CROSSING MARTINIZING	13 TAUNTON ST	PLAINVILLE	159813	MAD982545758	(508) 695-5085	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
54222	MASS LITE DIVISION	CROSS ST	PLAINVILLE	163028	1200047	(508) 695-3252	PLANT	BM150	Air Quality Permit
54495	LORUSSO BROS INC	3 MADISON ST	PLAINVILLE	163153	1200358	(508) 695-3252	PLANT	BM150	Air Quality Permit
119527	ELECTRO FIX INC	300 SOUTH ST	PLAINVILLE	159647	MAD982202053	(508) 695-0228	HANDLR	VQG-MA	Very Small Quantity Generator of Waste Oil or PCBs
130063	PLAINVILLE STOCK CO INC PLAINVILLE STOCK CO	104 SOUTH ST	PLAINVILLE	27440	MAD001463363	(508) 699-4433	HANDLR	SQG	Small Quantity Generator of Haz Waste
				54496	1200359	(508) 699-4434	PLANT	BM150	Air Quality Permit
130064	WHITING DAVIS COMPANY WHITING & DAVIS WHITING & DAVIS CO	23 WEST BACON ST	PLAINVILLE	119829	001195700	(508) 699-4411	TURRPT	BLW-TU	Below Toxics Use Reduction Reg Levels
				261366		(508) 699-4411	DISCH	BLW-W	Below Industrial Waste Water Reg Levels
				27196	MAD001195700	(508) 699-4411	HANDLR	LDFC	Landfill Closure with Hazardous Waste
130065	ENGELHARD IND DIV PLAINVILLE	30 TAUNTON ST	PLAINVILLE	27181	MAD001190644	(201) 321-5982	HANDLR	SQG	Small Quantity Generator of Haz Waste
132427	GRAPHIC IMAGES	75 WASHINGTON ST	PLAINVILLE	282450		(508) 695-5600	DISCH	NONTFR	Air Quality Permit
				282449		(508) 695-5600	PLANT	NONTFR	Air Quality Permit
				282448	MAV000005075	(608) 695-5600	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
133239	MICROWAVE SPECIALTIES INC	380 SOUTH ST	PLAINVILLE	27436	MAD001462035	(508) 695-9349	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
137270	CUMBERLAND FARMS 2023	139 SOUTH ST	PLAINVILLE	175808	MF0007594		FULDSP	FULDSP	Fuel Dispenser
137271	MICHAELS AUTOMOTIVE	177 WASHINGTON ST	PLAINVILLE	175809	MF0007607	(508) 695-9833	FULDSP	FULDSP	Fuel Dispenser
207669	HILSINGER COMPANY THE	33 WEST BACON ST	PLAINVILLE	367605	MAD001196872		HANDLR	SQG	Small Quantity Generator of Haz Waste
				206503	1200355	(508) 699-4406	PLANT	BM450	Air Quality Permit
261231	FLEETSERVE	125 E BACON ST	PLAINVILLE	261232	MAR000005918	(508) 384-7744	HANDLR	LQG-MA	Large Quantity Generator of Waste Oil or PCBs
287909	JOHNNYS OIL	46 SOUTH ST	PLAINVILLE	287910	MV5086952270		HANDLR	SQG-MA	Small Quantity Generator of Waste Oil or PCBs

APPENDIX B Continued: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Fac#	Facility Name	Street	Town	RO#	Old Sys ID	Phone	Type	Class	SWAP Description
288918	DEJONCO EXCAVATING CONTRACTORS	337 SOUTH ST	PLAINVILLE	288919	MV5086432800	(508) 643-2800	HANDLR	VQG-MA	Very Small Quantity Generator of Waste Oil or PCBs
291977	TAMMYS JOB SHOP	299 SOUTH ST	PLAINVILLE	296002		(508) 699-2397	PLANT	BLW-AQ	Air Quality Permit
				296001	MV6086992377	(508) 699-2397	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
312516	SCREENPRINT CONNECTIONS	170 EAST BACON ST	PLAINVILLE	312517	MV5086954626	(508) 695-4626	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
315945	PLAINVILLE TRUCK STOP	116 WASHINGTON ST	PLAINVILLE	316072	MF0007604		FULDSP	FULDSP	Fuel Dispenser
323399	SHELL 137828	10 TAUNTON ST	PLAINVILLE	324638	MF0007597		FULDSP	FULDSP	Fuel Dispenser
	MOTIVA ENTERPRISES LLC			323400	MAD980668339	(713) 241-2258	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
324523	BROOKS 887	13 TAUNTON ST	PLAINVILLE	328027	MAR000014811	(401) 825-3756	HANDLR	SQG	Small Quantity Generator of Haz Waste
332390	BROCKTON RENTALS	24 CROSS ST	PLAINVILLE	332391	MAR000015636		HANDLR	LQG-MA	Large Quantity Generator of Waste Oil or PCBs
340367	NORTHEAST CONCRETE PRODUCTS	24 CROSS ST	PLAINVILLE	340537			HANDLR	LQG-MA	Large Quantity Generator of Waste Oil or PCBs
				364642			DISCH	NONTFR	Air Quality Permit
				340368	1200511	(508) 695-1737	PLANT	BM150	Air Quality Permit
368042	EXXONMOBIL OIL CORP	11 TAUNTON ST	PLAINVILLE	372200	MAD985296300	(303) 986-8011	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
	MOBIL 10644			368043		(508) 695-2018	FULDSP	FULDSP	Fuel Dispenser
370900	FSP ONE INC	30 TAUNTON ST	PLAINVILLE	370901	MAR000504688		HANDLR	SQG	Small Quantity Generator of Haz Waste
209166	WAMPUM CORNER AUTO SERVICE INC	650 SOUTH ST	WRENTHAM	209167	MF0010618	(508) 384-6175	FULDSP	FULDSP	Fuel Dispenser
250146	MA HIGHWAY SITE 117	745 MADISON ST	WRENTHAM	315346	MHDWRE745	(617) 973-7727	FULDSP	FULDSP	Fuel Dispenser
283093	WRENTHAM VILLAGE PREMIUM OUTLETS	1060 SOUTH ST	WRENTHAM	283094		(201) 228-6111	GROUND	GROMAJ	Groundwater Discharge
361318	WRENTHAM DPW	360 TAUNTON ST	WRENTHAM	361319		(508) 384-5477	FULDSP	FULDSP	Fuel Dispenser
368111	EXXONMOBIL OIL CORP	165 SOUTH ST	WRENTHAM	372214	MAD985297027	(303) 986-8011	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
	MOBIL 11723			368112		(508) 384-8040	FULDSP	FULDSP	Fuel Dispenser
368113	MOBIL 18507	1001 SOUTH ST	WRENTHAM	368114		(508) 384-5390	FULDSP	FULDSP	Fuel Dispenser

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0012770	116 WASHINGTON ST	PLAINVILLE	Oil and Hazardous Material
4-0012768	116 WASHINGTON ST	PLAINVILLE	Oil
4-0014395	116 WASHINGTON ST	PLAINVILLE	Oil
4-0015377	9 OLD TAUNTON ST	PLAINVILLE	Oil
4-0001227	26 CROSS ST	PLAINVILLE	?
4-0001226	337 SOUTH ST	PLAINVILLE	?
4-0010132	33 WEST BACON ST	PLAINVILLE	Oil
4-0001295	W BACON ST	PLAINVILLE	Hazardous Material
4-0000874	23 W BACON ST	PLAINVILLE	?
4-0010587	RTE 495 SOUTH	WRENTHAM	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Plymouth Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Plymouth Water Division
<i>PWS Address</i>	11 Lincoln Street
<i>City/Town</i>	Plymouth, Massachusetts
<i>PWS ID Number</i>	4239000
<i>Local Contact</i>	Davis S. Proctor
<i>Phone Number</i>	(508) 830-4155

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

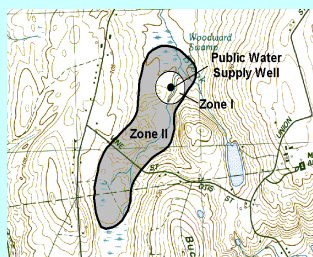
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Section 1: Description of the Water System

<i>Zone II #:</i>	<i>Well Names</i>	<i>Source IDs</i>	<i>Susceptibility:</i>
401	Lout Pond GP Well	4239000-01G	High
397	Wannos Pond Well	4239000-02G	High
398	Ship Pond Well	4239000-03G	High
395	Federal Furnace GP Well	4239000-04G	Moderate
396	North Plymouth GP Well	4239000-05G	High
400	Bradford GP Well	4239000-06G	High
399	Ellisville GP Well	4239000-07G	High
25	Darby Pond Well	4239000-08G	High
197	South Pond Well #1	4239000-09G	High
197	South Pond Well #2	4239000-10G	High
413	Savery Pond Well	4239000-11G	Moderate

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

The Plymouth Water Division receives its water from eleven groundwater wells located in ten Zone II recharge areas; see above Table for a list of wells and corresponding Zone IIs. An assessment of the Lout Pond GP Well is included in this report, though it is not currently in use and is listed as inactive by DEP. Plymouth also has two surface water supplies, Great South Pond and Little South Pond, which are considered emergency sources, therefore, assessments of these sources are not included in this report. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All of Plymouth's wells are treated with sodium hydroxide for corrosion control and disinfected to prevent microbial growth. The Bradford GP Well also receives filtration for iron and manganese removal. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Plymouth are dominated by forest with smaller areas of residential, agricultural, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors

4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Nine of the twelve Zone Is comply with DEP requirements. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Wannos Pond Well 4239000-02G and Ship Pond Well 4239000-03G – There are homes with on-site septic systems within the Zone Is.

Darby Pond Well 4239000-08G – There are cranberry bogs in the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential areas are common throughout all of the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the

groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

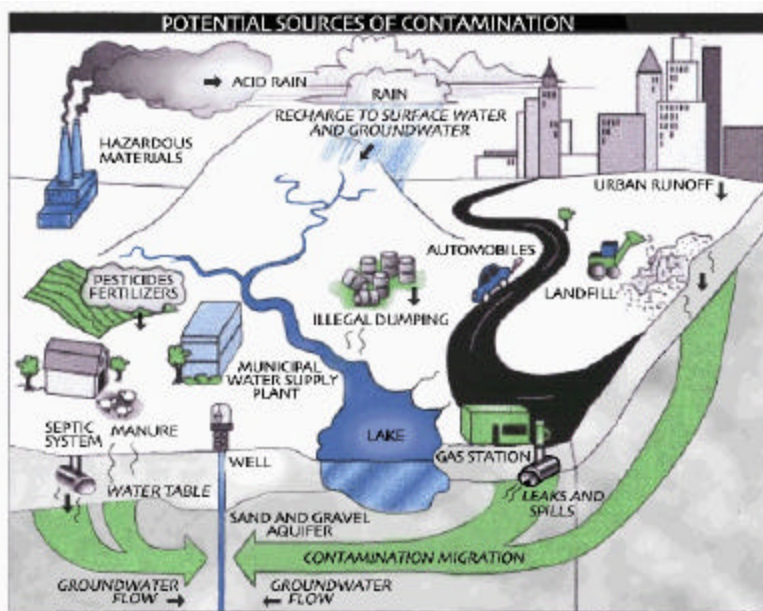
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Transportation Corridors - Route 3 runs through the Zone II for the Savery Pond Well. Local roads are common throughout all the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.

- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use –

Small areas of the Zone IIs are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

(Continued on page 7)

Source Protection Decreases Risk

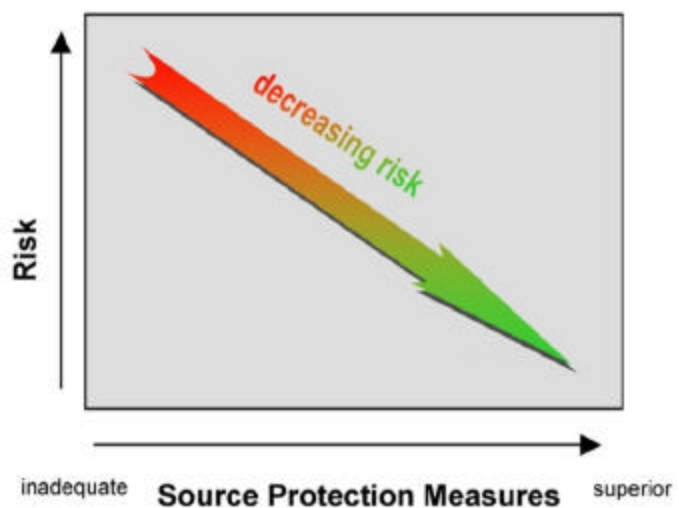


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agricultural				
Pesticide Storage or Use	9	H	#25, #197, #397, #398, #399, #400 & #401	Pesticides: leaks, spills, improper handling, or over-application (Cranberry Bogs, Agway and Home Depot)
Fertilizer Storage or Use	9	M	#25, #197, #397, #398, #399, #400 & #401	Fertilizers: leaks, spills, improper handling, or over-application (Cranberry Bogs, Agway and Home Depot)
Commercial				
Bus Washes	1	L	#400	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Service Stations/ Auto Repair Shops	1	H	#400	Automotive fluids and solvents: spills, leaks, or improper handling
Medical Facilities	1	M	#396	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (Two dental offices)
Printer And Blueprint Shops	1	M	#396	Printing inks and chemicals: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	1	M	#396 & #400	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	#396	Hazardous chemicals and wastes: spills, leaks, or improper handling or storage
Industry/Industrial Parks	2	H	#25 & #396	Industrial chemicals and metals: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	Numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	Numerous	L	All	Microbial contaminants
Fishing/Boating	Numerous	L	All	Fuel and other chemical spills, microbial contaminants
Schools, Colleges, and Universities	1	M	#400	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: Electric	2	L	#25 & #400	Corridor maintenance pesticides: over-application or improper handling; construction

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Agricultural Activities – There are several farms within the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses and follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



6. Protection Planning – Currently, Plymouth has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Establish a protection team, and use them to implement the goals of your Wellhead Protection Plan.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they no longer meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs’ community preservation web site, <http://commpres.env.state.ma.us/>.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES/NO	When feasible, gain control of Zone Is through ownership or conservation restrictions. Educate residents within Zone Is on BMPs for septic, lawn care and hazardous material use and storage.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town “Aquifer Protection District” bylaw meets DEP’s requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES/NO	Work with Carver to include Zone IIs in their wellhead protection controls. Continue reciprocal protection efforts with Kingston.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement goals of Wellhead Protection Plan.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see “Hazardous Materials Management: A Community's Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Other land uses and activities within the Zone II include auto repair shops, industrial parks, and sand and gravel mining. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through coordination with watershed committees, coordination with the Board of Health's inspection program and providing education to schools and residents.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone inspections, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with Cranberry growers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
772	ALGONQUIN HEIGHTS ASSOCIATION	ALGONQUIN TER	PLYMOUTH	Ground Water Facility (BRP)	Groundwater Discharge
29546	ACCURATE FABRICATORS INC	INDUSTRIAL PARK RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
35490	AGWAY PLYMOUTH	90 LONG POND RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
115377	JETCO MOLDING INC	51 ARMSTRONG RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
115414	ROGERS PRINT INC	41 CHRISTA MCAULIFFE BLVD	PLYMOUTH	Generator of Hazardous Waste	Small Quantity Generator
115516	MEMORIAL PRESS GROUP	9 LONG POND RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
131354	TECH ETCH INC	45 ALDRIN RD	PLYMOUTH	Toxics Use Reduction Filer	Large Quantity Toxics User
131354	TECH ETCH INC	45 ALDRIN RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
131354	TECH ETCH INC	45 ALDRIN RD	PLYMOUTH	Plant	Air Quality Permit
131354	TECH ETCH	45 ALDRIN RD	PLYMOUTH	Sewer Connection or Groundwater Discharge	Industrial Waste Water to Sewer
133473	PIXLEY RICHARDS INC	9 COLLINS AVE	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
133478	AAFCO TRANSMISSIONS	115 SANDWICH ST	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
261229	ELECTROPOLISH SYSTEMS INC	24 ALDRIN RD	PLYMOUTH	Sewer Connection or Groundwater Discharge	Air Quality Permit
261229	ELECTROPOLISH SYSTEMS	24 ALDRIN RD	PLYMOUTH	Generator of Hazardous Waste	Large Quantity Generator of Hazardous Waste

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
261229	ELECTROPOLISH SYSTEMS	24 ALDRIN RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
261229	ELECTROPOLISH SYSTEMS INC	24 ALDRIN RD	PLYMOUTH	Toxics Use Reduction Filer	Air Quality Permit
261244	CRANBERRY GRAPHICS	19 RICHARDS RD	PLYMOUTH	Plant	Air Quality Permit
261244	CRANBERRY GRAPHICS INC	19 RICHARDS RD	PLYMOUTH	Generator of Hazardous Waste	Small Quantity Generator
286340	KING COLLISION CENTER OF PLYMOUTH	48 HALMAN RD	PLYMOUTH	Industrial Wastewater Holding Tank Approval	Industrial Waste Water Holding Tank
286340	KING COLLISION CENTER OF PLYMOUTH	48 HOLMAN RD	PLYMOUTH	Generator of Hazardous Waste	Small Quantity Generator
288502	MA ARMSTRONG SKATING RINK	LONG POND RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
321282	AMERICANNA CO	29 ALDRIN RD	PLYMOUTH	Plant	Air Quality Permit
321282	AMERICANNA CO	29 ALDRIN RD	PLYMOUTH	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
362080	GAMBRO HEALTHCARE	45 RESNICK ROAD	PLYMOUTH	Ground Water Facility (BRP)	Groundwater Discharge

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No Department Of Fire Services Registered USTs Were Identified during the Assessment.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
None Identified at this time.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For The New Testament Church

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
March 2004

Table 1: Public Water System (PWS) Information

PWS NAME	The New Testament Church
PWS Address	1120 Long Pond Road
City/Town	North Plymouth, MA 02360
PWS ID Number	4239003
Local Contact	Robert Fantoni
Phone Number	(508) 888-1889

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #3 –East Well	03G	250	750	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The New Testament Church draws its drinking water from one well located just to the north of the building. The well has a Zone I of 250 feet and an Interim Wellhead Protection Area (IWPA) of 750 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **above ground storage tanks (ASTs) with heating oil;**
3. **septic systems;**
4. **residential development; and**
5. **roads.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate threats within the Zone I and IWPA.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The New Testament Church's Zone I contains vehicle parking and components of their septic system. The Zone I is owned by the Church and the DEP commends the Church for meeting this requirement for DEP. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Direct stormwater drainage from parking area away from the well and out of the Zone I.
 - ✓ Never dispose of hazardous materials into septic systems.
 - ✓ Post drinking water protection signs around Zone I area.
2. **Aboveground Storage Tanks (ASTs)** – There are ASTs with heating oil located within the IWPA. If managed improperly, above ground storage tanks can be a

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
parking lot	Yes	Yes	Moderate	stormwater runoff, spills
lawns	Yes	Yes	Moderate	fertilizer and pesticide use
above ground storage tanks	No	Yes	Moderate	leaks, spills
septic systems	Yes	Yes	Moderate	bacteria, improper disposal of hazardous materials
residential development	No	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks
roads	No	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

potential source contamination due to leaks or spills of the chemicals they store. ASTs should be equipped with containment

Recommendation:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold 110% of the complete liquid volume, should a spill occur.
- ✓ Encourage owners of ASTs to upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.

3. **Septic systems** - Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

4. **Residential Development** – There is residential development within the IWPA. Certain activities associated with residential development can be potential source of contamination to groundwater drinking water sources, including lawn care, hazardous materials and septic systems.

Recommendation:

- ✓ Instruct the lawncare and landscaping professionals never to use fertilizers or pesticides within the Zone I.
- ✓ Use best management practices when applying fertilizers or pesticides within the IWPA
- ✓ Educate residents in the IWPA about water supply protection. A brochure is included in this packet.

5. **Roads** – Local roads run throughout the IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Continue to maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The New Testament Church is commended for moving their well to meet DEP's Zone I requirements. Church officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

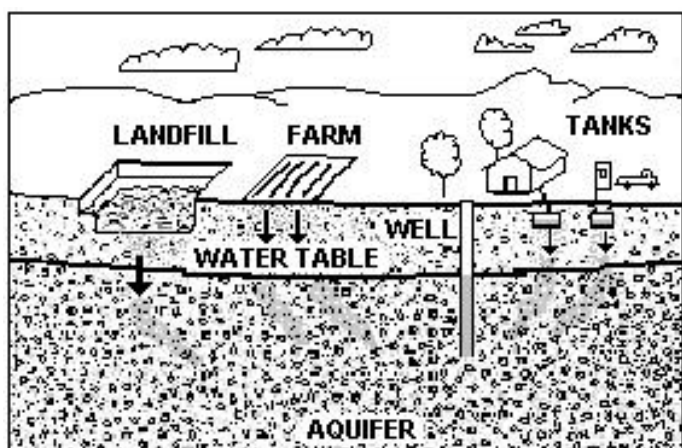


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Post water supply protection signs in the Zone I and IWPA.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Inspect and maintain the integrity of the containment structure for the AST.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

6. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For MCI Plymouth

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date DRAFT Prepared:
July 23, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	MCI Plymouth
PWS Address	Myles Standish State Forest
City/Town	Plymouth, Massachusetts
PWS ID Number	4239010
Local Contact	Charles St. Clair
Phone Number	(508) 291-2441

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
GP Well Forestry Camp	4239010-01G	250	720	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the facility is located on the east side of Circuit Drive north of the facility. GP Well Forestry Camp has a Zone I radius of 250 feet and an Interim Wellhead Protection Area (IWPA) radius of 720 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well serving the facility has chlorine added as a disinfectant and potassium hydroxide for pH adjustment. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Underground Storage Tank (UST); and,**
3. **Prison and Very Small Quantity Hazardous Waste Generator; and,**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat, as shown in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains an athletic field. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
2. **Underground Storage Tank** – A 1,000 gallon Underground Storage Tank for a backup diesel generator exists on-site. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals/oil they store.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Underground Storage Tank	No	Yes	High	Ensure that BMPs are in place for the handling, storage, and containment of stored materials.
Prison	No	Yes	Moderate	Handling, storage, and disposal of hazardous materials
Athletic Field	Yes	Yes	Moderate	Possible fertilizer and pesticide use
Vehicle Parking Lots	No	Yes	Low	Contaminants from parking areas can migrate into groundwater during storm events.
Very Small Quantity Hazardous Waste Generator	No	Yes	Low	Hazardous waste: spills, leaks, or improper handling or storage

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Consider replacing diesel generator with a liquid propane powered generator.
- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks (refer to attachments).
- ✓ During refilling of UST, ensure that the operator of the oil transport tanker does not leave the vehicle area while the UST is being filled.

3. **Prison and Very Small Quantity Hazardous Waste Generator** – Potential contaminant sources associated with prisons include solvents, microbial waste, and other chemicals: spills, leaks, or improper handling or storage of hazardous materials or hazardous wastes.

Recommendations:

- ✓ Work with prison officials to ensure that BMPs are in place for the handling, storage, and disposal of hazardous materials.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. MCI Plymouth is commended for posting the Zone I area with signs, having a Wellhead Protection Plan, a formal Emergency Response Plan, and providing wellhead protection education. MCI Plymouth should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Designate streets, driveways, and parking lots within the IWPA as low salt/no salt application zones.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.

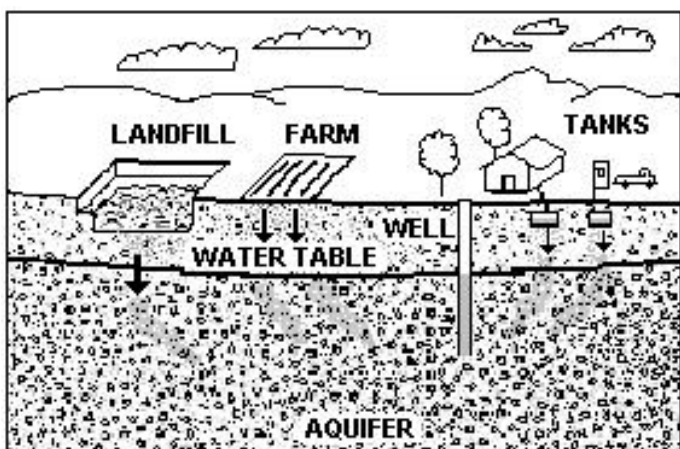


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Facilities Management:

- ✓ Underground Storage Tank - Check to determine whether the UST meets current construction standards. Contact your local fire department for further assistance.
- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Work with prison officials to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Prison officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas.
- Recommended Source Protection Measures Factsheet
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Plymouth South Elementary School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
June 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Plymouth South Elementary School
PWS Address	490 Long Pond Road
City/Town	Plymouth, Massachusetts 02360
PWS ID Number	4239017
Local Contact	Steven Nelson
Phone Number	(508) 224-4416

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	221	542	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Plymouth South Elementary School is located adjacent to the school. The well has a Zone I of 221 feet and an Interim Wellhead Protection Area (IWPA) of 542 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the School is treated with sodium hydroxide to raise the pH for corrosion control purposes. The DEP requires public water suppliers to monitor the

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **septic system;**
3. **school; and**
4. **parking and access roads.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate ranked threats within your water supply protection area.

1. **Zone I** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The school's Zone I contains part of the school building, parking area and access roads. The public water supplier does own all the land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct stormwater drainage away from Zone I.

2. **Septic System** – The septic system for the school is located within the IWPA.

Recommendation:

- ✓ Never dispose of hazardous materials or wastes down the drain.
- ✓ Septic system components should be inspected and maintained on a regular basis.

3. **School** – Activities associated with schools commonly involve hazardous materials

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
school	Yes	Yes	Moderate	solvents & other materials used in classrooms
lawn/playground	Yes	Yes	Moderate	fertilizer and pesticide use
parking lot and access roads	Yes	Yes	Moderate	stormwater runoff, spills
septic system	No	Yes	Moderate	bacteria, improper disposal of hazardous materials

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

such as fuel oil, laboratory, art, photographic, machine shop, landscaping, and cleaning chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed of.

Recommendation:

- ✓ Never dispose of hazardous materials down the drain.
- ✓ Develop an Integrated Pest Management (IPM) Plan for landscaping and lawn care, more information is available at <http://www.state.ma.us/dfa/pesticides/ipm/>
- ✓ Ensure that hazardous material storage, use and disposal are all performed in accordance with state and local regulations and in a manner that prevents groundwater contamination.

4. Parking and Roads – Vehicle parking and access roads are within the Zone I and IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Map stormwater drainage and direct away from the Zone I area
- ✓ Continue to maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. School officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ When possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Post water supply protections signs in the Zone I and IWPA.

- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum

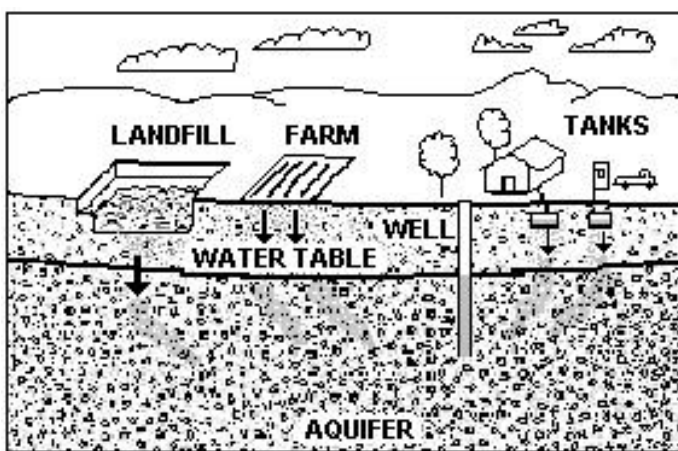


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508)94622726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

(K-6 and 7-12 curricula available; contact DEP for copies).

- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For The Baird Center

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
November, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	The Baird Center
PWS Address	900 Great Outlook Way
City/Town	Plymouth, Massachusetts
PWS ID Number	4239030
Local Contact	Executive Director, Christine Coffin
Phone Number	(508) 224-8041

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4239030-01G	214	528	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the facility is located approximately 1,000 feet south of Ship Pond Road near the facility. Well No. 1 has a Zone I radius of 214 feet and an Interim Wellhead Protection Area (IWPA) radius of 528 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Private Septic Systems; and,**
3. **Athletic fields.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains the access road to the school. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect road drainage in the Zone I away from well.

2. **Private Septic Systems** – Private septic systems are potential sources for the introduction of hazardous chemicals and microbial contaminants into the aquifer.

Recommendation:

- ✓ Regularly schedule maintenance and inspections of the septic system(s) and properly dispose of hazardous waste.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
Athletic fields	No	Yes	Moderate	Fertilizer and pesticide use

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

3. **Athletic Fields** – The pesticides and fertilizers used for lawn care and gardening can be transported from the ground surface down into the aquifer with storm water and excess irrigation water. The over-application or improper storage and disposal of pesticides and fertilizers could result in contamination of the aquifer.

Recommendation:

- ✓ Inform maintenance staff and contractors about the areas that are located within the IWPA of the public water supply well and instruct them to use proper storage, disposal, and application procedures with pesticides and fertilizers.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Baird Center is commended for having an approved Wellhead Protection Plan and posting signs indicating the presence of the drinking water recharge area. The Baird Center should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.

Zone I:

- ✓ Redirect the access road so that it no longer runs through the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Redirect road drainage in the Zone I away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator,

and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.

- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads around the well casing should slope away from the well and the well casing should extend above ground.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs

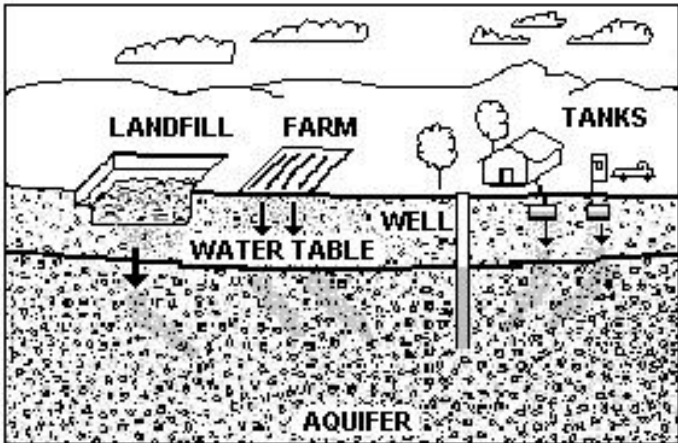


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Plymouth Water Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Plymouth Water Company
<i>PWS Address</i>	133 Raymond Road
<i>City/Town</i>	Plymouth
<i>PWS ID Number</i>	4239045
<i>Local Contact</i>	Don Rugg
<i>Phone Number</i>	(508) 888-7262

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

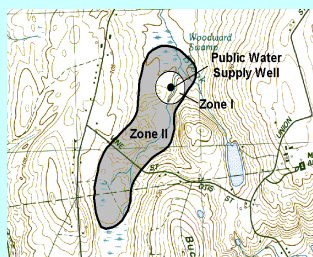
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 92

Susceptibility: High

Well Names	Source IDs
Well No. 1	4239045-01G

Zone II #: 369

Susceptibility: High

Well Names	Source IDs
Well No. 2	4239045-02G

Plymouth Water Company receives its water from two groundwater sources. Well No. 1 is located on the eastern side Lunn's Way, between Kim Circle and Lynn Circle. Well No. 2 is located north of Well No. 1 and west of Lunn's Way. Each well has a Zone I radius of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Both wells have potassium hydroxide added for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The land uses for the Zone IIs for Plymouth Water Company are predominantly residential with a minor amount of land used for cranberry growing and an elementary school (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Roadways and transmission lines
4. Schools
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Based upon the mapped well locations and the associated Zone I radii, it appears that the Zone Is are not entirely owned or controlled by the public water system. Only water

supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Well No. 1 4239045-01G - This Zone I contains a two million gallon concrete water reservoir and the water treatment plant, both of which are activities that are allowed within the Zone I. Based upon a review of orthophotos it appears that gravel mining operations have occurred within the Zone I. Electric power transmission lines run through the Zone I. It also appears that portions of 3 homes fall within the Zone I.

Well No. 2 4239045-02G - Electric power transmission lines run through the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 25% of the Zone II areas consist of residential land use. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

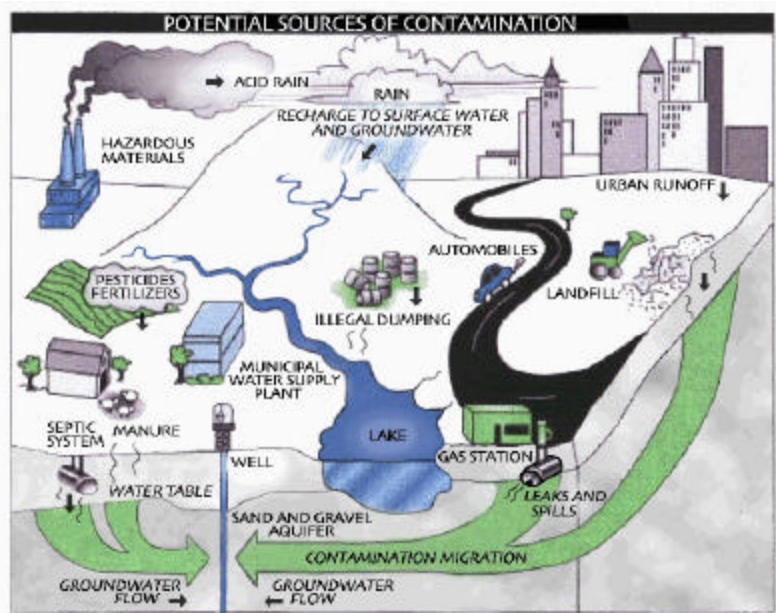
- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Roadways and Transmission Lines – There are no major transportation corridors running through the Zone IIs. However, local roads are common throughout the Zone II. Roadway construction, maintenance, and typical use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catchbasins.

There are electric utility transmission lines running through both the Zone I and Zone II areas. Over-application or improper handling of herbicides used for clearing the right-of-way is a potential source of contamination.

Roadways and Transmission Line Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along roadways. If

maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.
- ✓ Contact your local utility company to ensure that pesticides and herbicides are not sprayed in the Zone Is or Zone IIs.

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

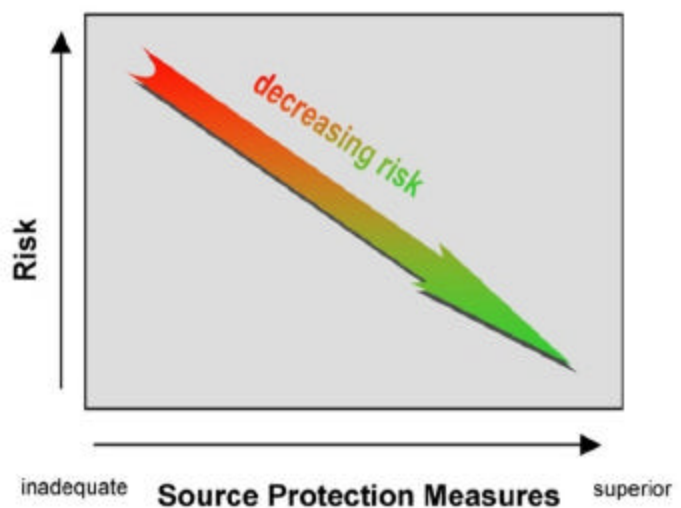


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	some	Moderate	#92 & #369	Fertilizers: leaks, spills, improper handling, or over-application (cranberry bogs)
Pesticide Storage or Use	some	High	#92 & #369	Pesticides: leaks, spills, improper handling, or over-application (cranberry bogs)
Residential				
Fuel Oil Storage (at residences)	numerous	Moderate	#92 & #369	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	#92 & #369	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	#92 & #369	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	numerous	Moderate	#92 & #369	Materials stored in tanks: spills, leaks, or improper handling (includes storage of water treatment chemicals at wellsites)
Schools	1	Moderate	#369	Fuel oil, laboratory, art photographic, shop, and other chemicals: spills, leaks, or improper handling or storage
Transmission Line Right of Ways	1	Low	#92 & #369	Corridor maintenance pesticides: over-application or improper handling (electrical line)

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
 2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
 3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.
- * **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

4. Schools – A small area of the Zone II for Well No. 2 is used by Plymouth South Elementary School. Activities associated with schools commonly involve hazardous materials such as fuel oil, laboratory, art, photographic, machine shop, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed into septic systems.

Schools Recommendations:

- ✓ Contact schools in the Zone II to discuss source protection issues including BMPs that they can reduce the risk of contamination.
- ✓ Assist schools with source protection education for maintenance staff, food preparation staff, teachers and students.

5. Agricultural Activities – There are cranberry growing operations occurring in relatively small portions of each of the Zone IIs. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

- ✓ Work with cranberry growers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

6. Presence of Oil or Hazardous Material Contamination Sites – At the time that this report was completed the Zone IIs did not contain any DEP Tier Classified Oil and/or Hazardous Material Release Sites. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ If oil or hazardous material release sites are identified in the Zone IIs in the future, monitor progress on any ongoing remedial action conducted for these sites.

7. Protection Planning – Currently, the Town has water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). The Town has also established a floor drain regulation. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation.

Protection Planning Recommendations:

- ✓ Work with the Town to incorporate the Zone IIs into the Aquifer Protection District.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Posting the Zone I area with signs.
- Having a Wellhead Protection Plan.
- Having a formal Emergency Response Plan.
- Providing wellhead protection education

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Monitor progress on any future remedial action conducted for oil or hazardous waste contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3 and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	If it is not feasible to purchase the Zone I, consider a conservation restriction to prohibit potentially threatening activities and/or a right of first refusal to purchase.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Remove all non-water supply activities from the Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	Continue working with the Town to have the Zone IIs included in the “Aquifer Protection District” .
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at school and agricultural uses within the Zone II.

(Continued from page 7)

in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
At the time that this report was generated there were no DEP permitted facilities located within the Zone IIs.					

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
At the time that this report was generated, no Tier Classified Oil and/or Hazardous Material Release Sites were located within the Zone IIs			



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Plymouth South High School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
March 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Plymouth South High School
PWS Address	409 Long Pond Road
City/Town	Plymouth, Massachusetts 02360
PWS ID Number	4239046
Local Contact	Steven Nelson
Phone Number	(508) 224-4416

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	312	978	Moderate
Well #2	02G	312	978	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Plymouth South High School receives its drinking water from two groundwater wells. The wells have Zone I radii of 312 feet and an Interim Wellhead Protection Area (IWPA) radii of 978 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the well locations, and the Zone I/ IWPA boundaries.

The water is treated for corrosion control through sodium hydroxide addition to raise the pH. The DEP requires public water suppliers to monitor the quality of the water. For

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Zone I issues;**
2. **Golf course;**
3. **School, and;**
4. **Parking and access roads .**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of moderate ranked land uses within the Zone I and IWPA.

1. **Zone Is** – Currently, the well does meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The School's Zone I is owned by the water supply (town) and is mostly wooded. The north eastern edge of the Zone I abuts an athletic field, pesticides and fertilizers should never be used in a Zone I area. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Ensure that pesticides and fertilizers are never applied within the Zone I.
 - ✓ Never store pesticides, fertilizers or road salt within the Zone I.
2. **Golf Course** – There is a portion of a neighboring golf course within the IWPA. Golf courses can be a threat to water supplies because of the pesticides, fertilizers and fuels that are used and stored as part of their operations. Note that the golf course is also a public water supply and shares your same concerns for source water protection.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
golf course	No	Yes	Moderate	fertilizer and pesticide use, fuel storage
school	No	Yes	Moderate	Hazardous materials used in classrooms, and building operation and maintenance
parking lot and access roads	No	Yes	Moderate	stormwater runoff, spills
athletic fields	No	Yes	Moderate	fertilizer and pesticide use

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Encourage the golf course to minimize its use of fertilizers and pesticides with an active Integrated Pest Management (IPM) Plan. For more information on IPM visit <http://www.state.ma.us/dfa/pesticides/ipm/>
- ✓ Coordinate Source Protection efforts with the golf course owners.

3. **School** – Activities associated with schools commonly involve hazardous materials such as fuel oil, laboratory, art, photographic, machine shop, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed of.

Recommendation:

- ✓ Develop an Integrated Pest Management (IPM) Plan, for more information visit <http://www.state.ma.us/dfa/pesticides/ipm/>
- ✓ Ensure that hazardous material storage, use and disposal are all performed in accordance with state and local regulations and in a manner that prevents groundwater contamination.

4. **Vehicle parking and access roads** – Parking for the school and access roads are within the IWPA for the wells. Runoff and spills from parking lots and roads can contaminate public wells.

Recommendations:

- ✓ Direct stormwater drainage away from the wellhead.
- ✓ Ensure emergency response plan includes contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Plymouth South High School is commended for meeting DEP's Zone I requirements and using BMPs to reduce the fertilizer and pesticide use on its athletic fields. School officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, storage, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.

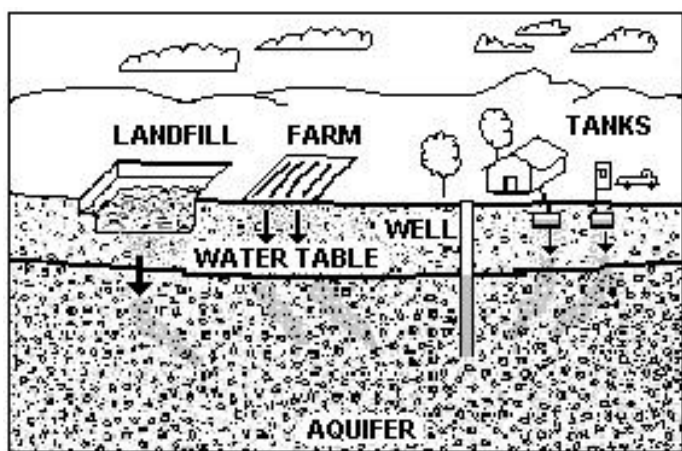


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).

Facilities Management:

- ✓ Develop an Integrated Pest Management (IPM) Plan, for more information visit <http://www.state.ma.us/dfa/pesticides/ipm/>

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Herring Cove Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date DRAFT Prepared:
July 29, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Herring Cove Condominiums
PWS Address	50 Nightingale Road
City/Town	North Plymouth, Massachusetts
PWS ID Number	4239049
Local Contact	John Sanna
Phone Number	(508) 759-4559

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4239049-01G	150	473	High
Well No. 2	4239049-02G	150	473	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for Herring Cove Condominiums are located on the east side of Nightingale Road and generally northeast of the residential buildings. Both Well No. 1 and Well No. 2 have Zone I radii of 150 feet and Interim Wellhead Protection Area (IWPA) radii of 473 feet. The IWPA's provide interim protection areas for water supply wells when the actual recharge area has not been delineated. The actual recharge area to the wells may be significantly larger or smaller than the IWPA's. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPA's.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Both wells are treated for corrosion control by pH adjustment. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I; and,**
2. **Residential Land Uses**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains Nightingale Road. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect the road so that it no longer runs through the Zone I.
- ✓ If the road cannot be moved redirect road drainage in the Zone I away from the wells.

2. **Residential Land Uses** –All of the residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- ✓ **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Driveways/road and parking areas	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Fuel Storage Above Ground	No	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Septic System	No	Yes	Moderate	See septic systems brochure in the appendix
Lawn care/gardening	No	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Athletic Field	No	Yes	Moderate	Fertilizer and pesticide use

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.

- ✓ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- ✓ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store. Although not used by Herring Cove Condominium residents, fuel oil USTs/ASTs may exist outside of the association's property but within the IWPA.
- ✓ **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Promote BMPs for stormwater management and pollution controls.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Herring Cove Condominiums is commended for posting the Zone I, having an approved Wellhead Protection Plan, using propane for heating purposes, and for enforcing regularly scheduled pumping of septic tanks. Herring Cove Condominiums should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect the driveway/access road so that it no longer runs through the Zone I.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Redirect the road so that it no longer runs through the Zone I.
- ✓ If road can't be removed from Zone I, restrict use of salt and drain stormwater away from well.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground

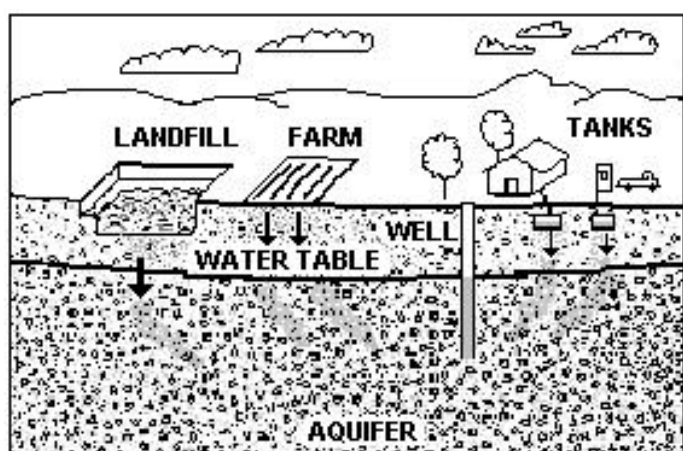


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

tanks for leaks, etc.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on association property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

2. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
The Pinehills Water Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	The Pinehills Water Company
<i>PWS Address</i>	431 Beaver Dam Road
<i>City/Town</i>	Plymouth, MA 02360
<i>PWS ID Number</i>	4239055
<i>Local Contact</i>	Marisa Picone-Devine
<i>Phone Number</i>	508-888-7262

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

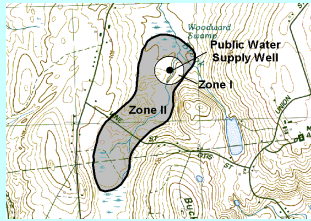
This report includes the following sections.

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: is the larger area that is likely to contribute water to the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Zone II #: 412

Susceptibility: Moderate

Well Name	Source IDs
Well #1	4239055-01G
Well #2	4239055-02G
Well #3	4239055-03G

The Pinehills Water Company has three active wells. The water company was formed in 2001 to provide water to the residents and businesses within The Pinehills community in Plymouth. The wells have a Zone I of 400 feet and a Zone II that has been hydrogeologically determined. These terms are defined in the Glossary. The wells have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map for Zone I and Zone II boundaries.

For current information on treatment and the results of water quality monitoring, please contact the public water system contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II is entirely located in Plymouth. Land uses and activities that are potential sources of contamination for the wells are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Golf Course
4. Fire Station
5. High School/Groundwater Discharge
6. Transportation Corridors

The overall ranking of susceptibility to contamination for the system is Moderate, based on the presence of at least one Moderate threat land use within the water supply protection areas, as seen in Table 2.

1. **Land Uses Within Zone I** – The Zone I for the wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The Pinehills Water Company owns or controls the Zone I and conducts regular inspections. There are no non-water supply activities occurring within the Zone I.

Zone I Recommendations

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Keep any non-water supply activities out of the Zone I.
- ✓ Do not use fertilizers, pesticides or road salt within the Zone I.

2. Residential Land Uses – At present, approximately 7% of the Zone II consists of residential land uses. The total community population at build-out will be about 2800 people. Common potential sources of contamination associated with residential land use include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations

- ✓ Continue to educate residents on source protection measures for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and at www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Continue to work with officials in Plymouth to improve water supply protection.
- ✓ Promote Best Management Practices (BMPs) for stormwater management and pollution controls. Visit DEP’s web site for additional

information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

- ✓ Encourage the Town of Plymouth to conduct household hazardous waste collection days.

3. Golf Course - There is a golf course within the Zone II.

Golf Course Recommendation

- ✓ Minimize the use of pesticides and fertilizers. Use BMPs for handling and using chemicals and washing vehicles.

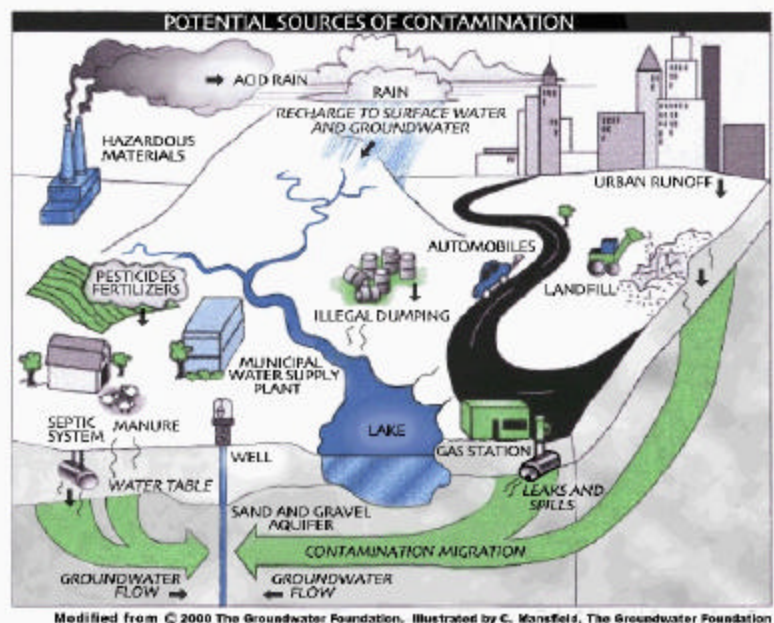
4. Fire Station - There is a Town of Plymouth Fire Station within the Zone II.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Fire Station Recommendation

- ✓ Use BMPs for handling and using chemicals and washing vehicles.

5. **High School/Groundwater Discharge** - There is a high school within the Zone II. The school is also a public water system.

School Recommendation

- ✓ Send school administrators the enclosed *Healthy Schools Fact Sheet*.

6. Transportation Corridors -

Route 3 and local roads run through the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations

- ✓ Identify stormwater drains and the drainage systems along transportation corridors. Wherever possible, ensure that drains discharge to outside the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Check with the local Conservation Commission to determine whether pesticides are used on road rights-of-way. Highway departments and utilities are responsible for submitting a copy of their approved Vegetation

Management Plan and Yearly Operating Plan to the Town if pesticides are used in their rights-of-way. There are state regulatory setbacks and other requirements to help protect drinking water sources from pesticide over-application or spills.

Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – The Town of Plymouth currently meets DEP's Wellhead Protection regulations, 310 CMR 22.21(2).

Protection Planning Recommendations

- ✓ Develop a Wellhead Protection Plan. Establish a protection team and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

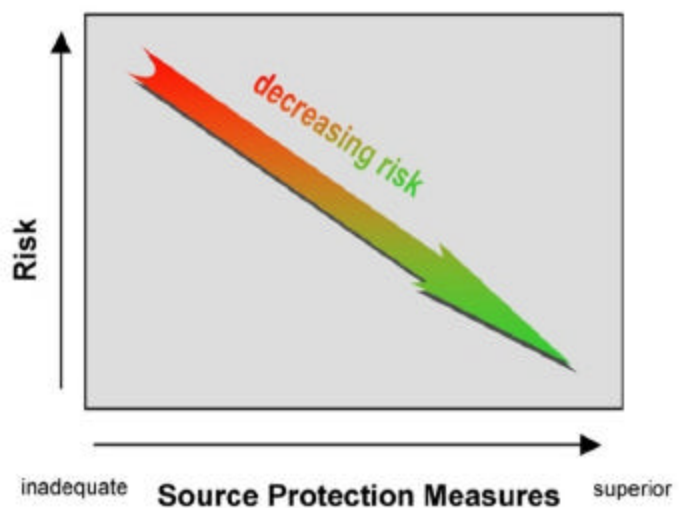


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential			
Septic Systems	few	M	microbial contaminants; improper disposal of hazardous chemicals
Fuel Oil Storage	few	M	spills, leaks or improper handling and storage of fuel oil
Lawn Care	few	M	over-application or improper storage and disposal of pesticides
Commercial			
Golf Course	1	M	spills or over-application of pesticides and fertilizers; leaks, spills from vehicles and maintenance products
Miscellaneous			
Fire Station	1	M	vehicle wash water; spills or leaks of chemicals
High School	1	M	leaks or spills of chemicals from laboratories, art & photographic studios, machine shop; runoff from parking lot
Transportation Corridors	local roads & Route 3	M	leaks or spills of fuel, other hazardous materials or pesticides

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

copy of DEP's guidance *Developing a Local Wellhead Protection Plan*.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection

As with many water supply protection areas, this system's Zone II contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- ? working with town officials in Plymouth to protect the public wells;
- ? conducting regular inspections of the water supply protection areas; and
- ? educating residents about their role in protecting their sources of drinking water.

Source Protection Recommendations

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly.
- ✓ Develop a wellhead protection plan.
- ✓ Educate residents on ways they can help protect drinking water.
- ✓ Work with emergency responders to ensure that they are aware of the stormwater drainage in the Zone I & II and to cooperate on responding to spills or accidents.



Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Conclusions

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target in-

(Continued on page 8)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES (and fenced)	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES—Plymouth	
Do neighboring communities protect the Zone II areas extending into their communities?	N/A	The Zone II is delineated entirely within Plymouth
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow <i>Developing a Local Wellhead Protection Plan</i> available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal <i>Emergency Response Plan</i> to deal with spills or other emergencies?	YES	Work with the Town’s Local Emergency Planning Committee to conduct drills with local emergency response officials to test procedures.
Does the municipality have a wellhead protection committee?	NO	A committee can be helpful with implementing wellhead protection measures.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	
Does the PWS provide wellhead protection education?	YES	Continue to educate residents on how <u>they</u> can protect drinking water.

(Continued from page 6)

spections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

A. DEP Permitted Facilities

B. Source Protection Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Healthy Schools Fact Sheet*

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A - DEP Permitted Facilities**REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS AT THE PINEHILLS.**

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
1198	Plymouth Vocational High School	Long Pond Road	Plymouth	Groundwater Facility	Groundwater Discharge

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Litecontrol Corporation

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
March 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Litecontrol Corporation
PWS Address	25 Spring Street
City/Town	Plympton
PWS ID Number	4240001-01G
Local Contact	Nicholas Sealey
Phone Number	781-294-0100

Well Name	Source ID#	Zone I (in feet)	IWPA	Source Susceptibility
Well #1	4240001-01G	250	750	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

1. Description of the Water System

Well #1 provides a public water supply to the employees at Litecontrol Corporation in Plympton. The well has a Zone I of 250 feet and an Interim Wellhead Protection Area (IWPA) of 750 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (local road & access road to plant)
2. Manufacturing Facility, Parking
3. Residences

Table 2: Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Local Road, Access Road to Plant	Yes	Yes	M	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way; stormwater contaminants; road salt
Manufacturing Facility, Parking	No	Yes	H	spills from hazardous materials & wastes, stormwater runoff from the parking lot
Residences	No	Yes	M	pesticides and fertilizers from lawn care; leaks or spills of automotive fluids; stormwater; microbial contamination from septic systems

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The overall ranking of susceptibility to contamination for the well is HIGH based on the presence of at least one HIGH threat within the Zone I and IWPA.

1. **Zone I**– The public water system owns or controls the Zone I and posts water supply protection signs. The public water system does not meet DEP's Zone I requirements because there are non-water supply activities within the Zone I. Spring Street and the access road to the plant are located within the Zone I.

Leaks and spills, vehicular accidents, and over-application or spills of pesticides are potential sources of contamination. In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

Recommendations

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Do not use pesticides or fertilizers within the Zone I.
- ✓ Do not store de-icing materials within the Zone I.
- ✓ Encourage the Town to use a road salt alternative within the Zone I.
- ✓ Work with the Town to direct stormwater from Spring Street away from the well.

2. **Manufacturing Facility, Parking** – The plant and parking lot are located within the IWPA. Leaks or spills of hazardous materials and wastes are a concern.

Recommendation

- ✓ Use Best Management Practices to handle, store and dispose of hazardous materials and wastes.

3. **Residential** – There are a few residences within the IWPA.

Recommendation

- ✓ Distribute the fact sheet *Residents Protect Drinking Water*.

3. Recommendations for Protection

Implementing protection measures will reduce susceptibility to contamination.

Priority Recommendations:

Zone I

- ✓ Continue to inspect the Zone I.

Training and Education

- ✓ Educate employees on source protection measures for protecting water supplies. Describe proper use, storage and disposal of materials within the Zone I. See the enclosed *Businesses Protect Drinking Water* fact sheet.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or deicing materials within the Zone I.

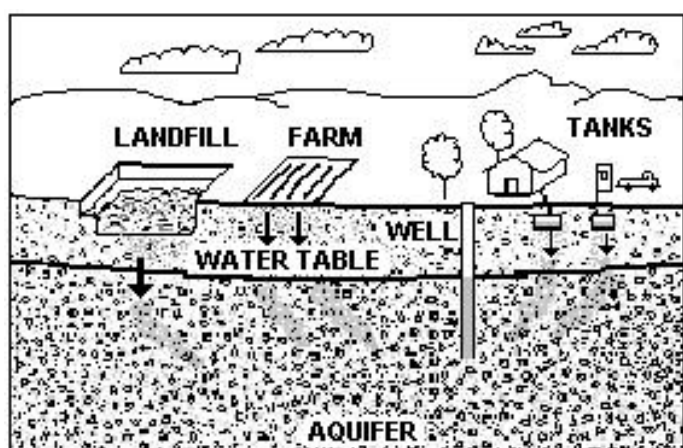


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

Planning

- ✓ Work with town officials to improve water supply protection.

Funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- *Residents Protect Drinking Water* fact sheet
- *Businesses Protect Drinking Water* fact sheet



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Dennett Elementary School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May, 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Dennett Elementary School
PWS Address	80 Crescent Street
City/Town	Plympton, Massachusetts
PWS ID Number	4240004
Local Contact	Mary Dickerson
Phone Number	(781) 585-3659

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 2	424004-02G	174	469	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The active well for Dennett Elementary School is located east of Crescent Street and south of Ring Road. Well No. 2 has a Zone I radius of 174 feet and an Interim Wellhead Protection Area (IWPA) radius of 469 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. Well No. 1 is an inactive emergency source and, therefore, currently does not provide drinking water to the school.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Residential Land Uses; and,**
3. **School**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Inappropriate Activities in Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains the entrance road to the school, parking areas, a road, landscaped areas. In addition, one of the neighboring properties may have junk located within the Zone I. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Redirect road and parking lot drainage in the Zone I away from well.
2. **Residential Land Uses** –All of the residences within the IWPA have on-site septic systems. If managed improperly, activities associated with residential areas can

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	IWPA	Threat	Comments
Fuel Oil Storage	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Septic Systems	Yes	Moderate	See septic systems brochure in the appendix
Roads and Driveways	Yes	Moderate	Limit road salt usage and provide drainage away from wells
School	Yes	Moderate	Fuel oil, laboratory, art, and other chemicals: spills, leaks, or improper handling or storage
Landscaping	Yes	Moderate	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Stormwater Drains/ Retention Basins	Yes	Low	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

contribute to drinking water contamination. Common potential sources of contamination include:

- ✓ **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
 - ✓ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
 - ✓ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
 - ✓ **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.
3. **School** - Activities associated with schools commonly involve hazardous materials such as fuel oil, laboratory, art, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed into septic systems. Landscaped portions of school property including playing fields often receive pesticide and fertilizer applications.
- Schools recommendations:**
- ✓ The school should investigate source protection issues including BMPs that can reduce the risk of contamination.
 - ✓ Provide source protection education for building and grounds maintenance staff, food preparation staff, teachers and students.
 - ✓ Use BMP's for the storage, handling, and use of all pesticides, herbicides, and fertilizers.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Dennett Elementary School is commended for having a formal Emergency Response Plan in place to deal with spills or other emergencies. Dennett Elementary School should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.

Zone I:

- ✓ Conduct regular inspections of the Zone I.
- ✓ If it's not feasible to purchase privately owned land within

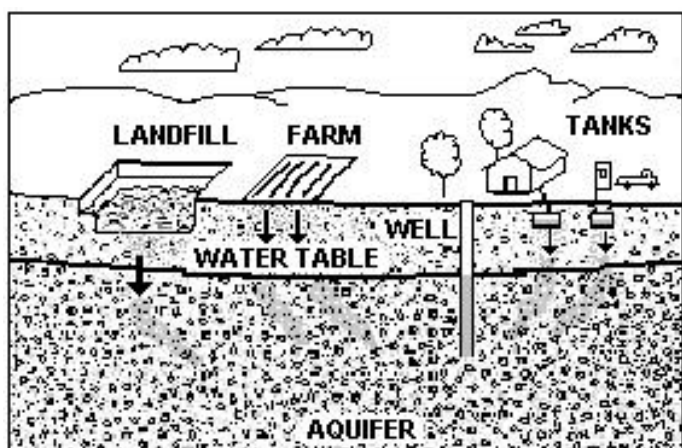


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

- ✓ Frequently sweep and properly dispose of debris buildup on the parking lot and school entrance road.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil storage tanks to incorporate proper containment and safety practices.
- ✓ Implement BMPs to ensure the proper handling and storage of hazardous materials.
- ✓ Implement BMPs for the use of fertilizer, herbicides and pesticides on the property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in any future Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Healthy Schools Fact Sheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Provincetown Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Provincetown Water Department
<i>PWS Address</i>	26 Alden Street
<i>City/Town</i>	Provincetown, Massachusetts 02657
<i>PWS ID Number</i>	4242000
<i>Local Contact</i>	David F. Guertin
<i>Phone Number</i>	(508) 487-7060

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

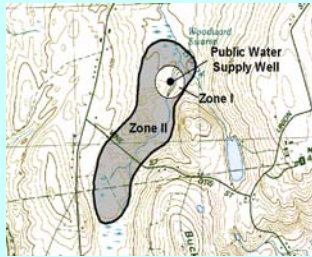
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 124

Susceptibility: High

Well Names	Source IDs
GP Well #1 (Inactive)	4242000-01G
North Truro USAF Base Well #4	4242000-04G
North Truro USAF Base Well #5	4242000-05G

Zone II #: 121

Susceptibility: High

Well Names	Source IDs
Knowles Crossing Well	4242000-02G

Zone II #: 123

Susceptibility: High

Well Names	Source IDs
Paul D. Daley Well	4242000-03G

The Provincetown Water Department supplies drinking water to the Town of Provincetown and several areas within the Town of Truro. Provincetown's water supply sources consist of three wellfields located in three Zone II recharge areas within the Pamet lens of the Cape Cod Aquifer. The Pamet lens extends from the north side of the Pamet River to Pilgrim Lake. The primary source is the South Hollow Wellfield, which consists of eight individual wells. Provincetown's secondary supply is the Knowles Crossing Wellfield that consists of two active wells. During the summer peak season (June 1 through October 1) the Town of Provincetown also uses two additional wells located at the former North Truro Air Force Base, which now lie within the boundaries of the Cape Cod National Seashore. Provincetown, Truro and the National Park Service own the land around the South Hollow Wellfield. Provincetown owns the land surrounding the Knowles Crossing Wellfield. The North Truro Air Force Base wells are within the boundary of the Cape Cod National Seashore. Activities are restricted on the grounds surrounding the wellfields by the Town of Provincetown and by the Cape Cod National Seashore on lands adjacent to and surrounding the wellfields. Also at the North Truro Air Force Base is an inactive well, GP Well #1, which will be assessed as part of this report. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

The groundwater pumped from these sources is treated at two chemical addition facilities. The Paul D. Daley facility is located at the South Hollow Wellfield. The other chemical addition facility is located at the Knowles Crossing Wellfield. At these two facilities potassium hydroxide is used to increase the pH of the water to a target level of 7.5 for corrosion control. Chlorine (sodium hypochlorite) is added for secondary disinfection as a means of protecting the water distribution system from microbiological contaminants. In addition, a polyphosphate sequesterant is used for the control of trace levels of iron and manganese. For current information on monitoring results and treatment, please

contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Provincetown are predominantly forest and residential land uses with small areas of commercial and transportation land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural Activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Not all of Provincetown's Zone Is are owned or controlled by the Water Department. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the

Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: GP Well #1 (inactive) and North Truro Air Force Base Well #5 – The shared Zone I for these wells is used for National Seashore emergency use.

Zone I: Knowles Crossing Well – There are residential uses including two hotels with septic and Route 6A runs through the Zone I.

Zone I: Paul D. Daley Well – There are homes with septic and local roads within the Zone I.

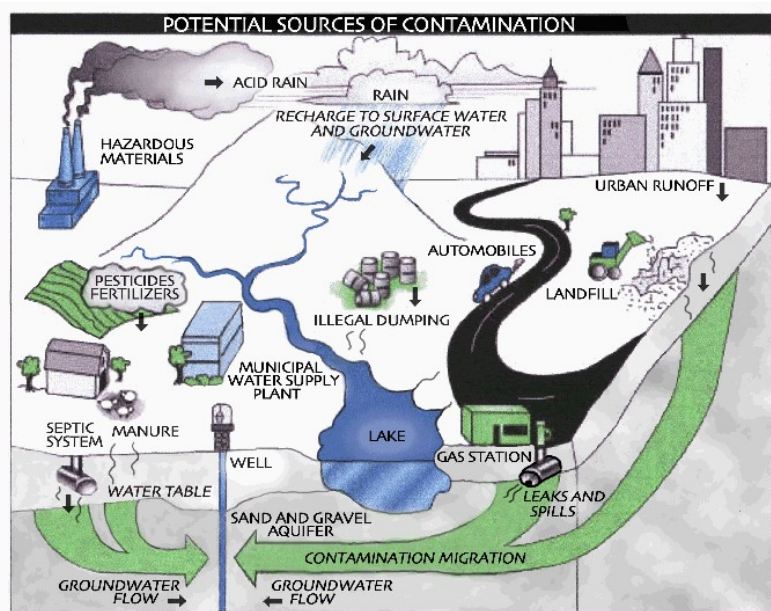
Zone I: North Truro Air Force Base Well #4 – There are residential activities associated with the old air base with the

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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possibility or future use as an art center.

Zone I Recommendations:

- ✓ Educate residents within Zone Is on the BMPs for protecting water supplies; ensure to include proper septic system operation and maintenance.
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Residential land uses are prevalent in all the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and

contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 6 and Route 6A run through the Zone IIs. Local roads are

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

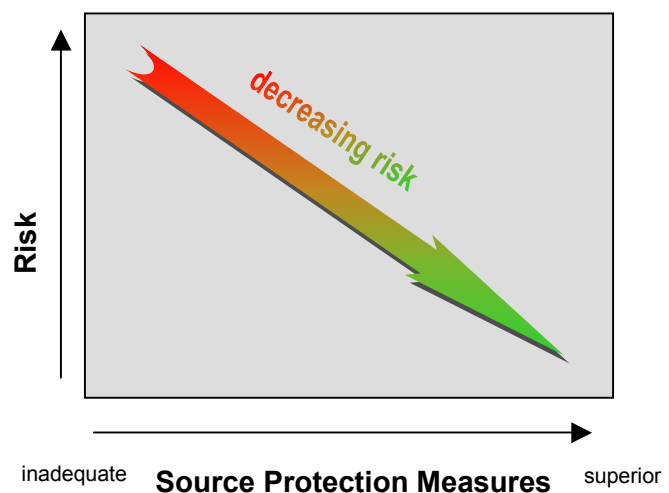


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	some	M	123	Fertilizers: leaks, spills, improper handling, or over-application (cranberry bogs)
Pesticide Storage or Use	some	H	123	Pesticides: leaks, spills, improper handling, or over-application (cranberry bogs)
Commercial				
Gas Stations	1	H	121	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Cemeteries	1	M	123	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Junk Yards and Salvage Yards	1	H	123	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Sand And Gravel Mining/Washing	1	M	123	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Residential				
Fuel Oil Storage (at residences)	numerous	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	few	M	All	Materials stored in tanks: spills, leaks, or improper handling (includes storage of water treatment chemicals at wellsites)
Military Facilities (Historical) Type: Air Force Base	1	H	124	Pesticides and herbicides, fuel, chemicals and other materials: spills, leaks, or improper handling or storage; may include ordnance or waste landfill/dump sites
Oil or Hazardous Material Sites	1	--	123 & 124	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Miscellaneous Continued				
Stormwater Drains/ Retention Basins	some	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way - Type: Electrical	few	L	All	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	M	121 & 123	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	3	H	All	Stored materials: spills, leaks, or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town of Truro and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use – Small areas of the Zone IIs are used for commercial land uses. Activities associated with commercial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet

“Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – Zone IIs #123 and #124 contain a DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Number 4-0000897. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Agricultural Activities – There a vineyard in Zone II #123. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. The use of fertilizers and pesticides is limited due to restrictions, however, it is a concern for water supply protection purposes.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values - clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



7. Protection Planning – Currently, Provincetown does not meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Because Provincetown’s sources are in a neighboring community, Truro, Provincetown must meet DEP’s “Best Effort” requirements to attain compliance for DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Establish a protection team, and use the team to implement the goals of your Wellhead Protection Plan.
- ✓ Work to convince Truro to pass bylaws and health regulations to meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2).
- ✓ If Truro’s controls do not regulate floordrains, work to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with Truro’s town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Educate residents within Zone Is on Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials. When feasible in the future gain control of Zone Is.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	NO	Signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	N/A	Encourage Truro to pass Wellhead Protection Controls that meet 310 CMR 22.21(2). Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES/NO	Work with Truro to expand controls for your Zone IIs.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Team to implement goals of Wellhead Protection Plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include gas stations, a junk/salvage yard and sand and gravel mining. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Partnering with Truro to pass bylaws requiring all underground storage tanks to be removed and replaced with double walled above ground storage tanks.
- Partnering with the Town of Truro to receive a DEP grant to provide source protection educational materials to residents and offer hazardous waste collection days for the towns of Truro, Provincetown and Wellfleet.
- Coordinating restrictions on the land surrounding the wells with the Cape Cod National Seashore.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Continue to educate residents; both in Provincetown and Truro, on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Use Wellhead Protection Committee to implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 2

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
36089	EDWARDS AUTOMOTIVE	RTE 6 NOONS HEIGHT	NORTH TRURO	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
137146	CAPE COD OIL	435 ROUTE 6	TRURO	Fuel Dispenser	Fuel Dispenser
137167	SONNYS CHEVRON STATION	RTE 6	NORTH TRURO	Fuel Dispenser	Fuel Dispenser
361870	NOONS CONSTRUCTION	NOONS HEIGHT RD	TRURO	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
CITGO / ROUTE 6 STATION ID #30006	435 ROUTE 6	TRURO	Composite	2 Walls	Interstitial Monitoring	6000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	4000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	4000	Diesel
NEAR FAA SEARCH RADAR TOWER ID #1480	OLD N TRURO AIR STATION	NORTH TRURO	Steel	1 Wall	Not Available	2000	Diesel
SONNY'S SERVICE STATION ID #1488	482 ROUTE 6	NORTH TRURO	Cathodic	1 Wall	Approved In-Tank Monitor	5000	Gasoline
			Composite	2 Walls	Interstitial Monitoring	10000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000897	HIGHLAND RD	TRURO	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Randolph/Holbrook Joint Water Board

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Randolph-Holbrook Joint Water Board
<i>PWS Address</i>	50 North Franklin Street
<i>City/Town</i>	Holbrook, Massachusetts
<i>PWS ID Number</i>	3244001
<i>Local Contact</i>	Thomas Cummings
<i>Phone Number</i>	(781) 767-1800

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

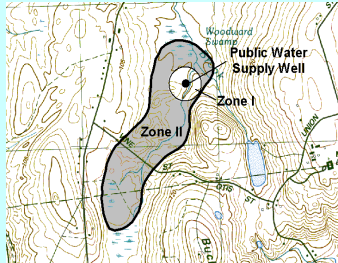
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

IWPA

Susceptibility: High

Well Names	Source IDs
South Street Well #3	3244000-01G
South Street Well #2	3244000-02G
South Street Well #1	3244000-03G
Donna Road Tubular Wells	3244000-04G

Zone II #: 222

Susceptibility: High

Well Names	Source IDs
Donna Road Well	3244000-0AG

The Randolph-Holbrook Joint Water Board (Randolph-Holbrook) maintains and operates five public water supply sources. Randolph/Holbrook's sources are located within the Weymouth & Weir River basin. The wellhead protection area for the Donna Road Well (0AG), which is a proposed well, is located entirely within the town of Holbrook. This well has a Zone I radius of 400 feet.

South Street Well #3 (01G), South Street Well #2 (02G), and South Street Well #1 (03G), all of which are inactive sources, have Interim Wellhead Protection Areas (IWPAs) that are located in Holbrook and Randolph. The Donna Road Tubular Wells (04G), which is also an inactive source, has an IWPA that is located entirely in Holbrook. Tubular wells have a Zone I radius of 250 feet around each well; the Zone I radius for the other wells is 400 feet. All of the wells are located in aquifers with a high vulnerability to contamination due to the absence of a hydrogeologic barrier (i.e. confining clay layer) that can prevent contaminant migration. Please refer to the attached map of the IWPA.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The IWPAs and Zone II for Randolph-Holbrook are primarily a mixture of forest and residential land uses, with portions consisting of mining, commercial, and industrial activities (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Hazardous Materials Storage and Use
3. Residential Land Uses
4. Federal Superfund Site and Oil or Hazardous Material Contamination Sites
5. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the all of Randolph-Holbrook's wells is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone Is – Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as public roads.

Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Hazardous Materials Storage and Use – A small percent of the land area within the Zone II and IWPA contains commercial, industrial, and mining land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in USTs/ASTs. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure "Industrial Floor Drains" for more information.

3. Residential Land Uses – Residential areas are common throughout the IWPA and Zone IIs. Some of the areas have public sewers, and some use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

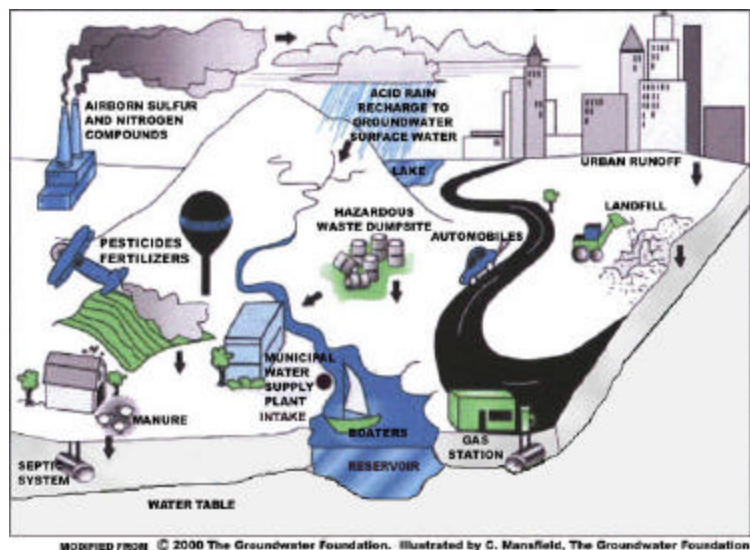


Figure 1: Sample watershed with examples of potential sources of contamination.

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.



Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

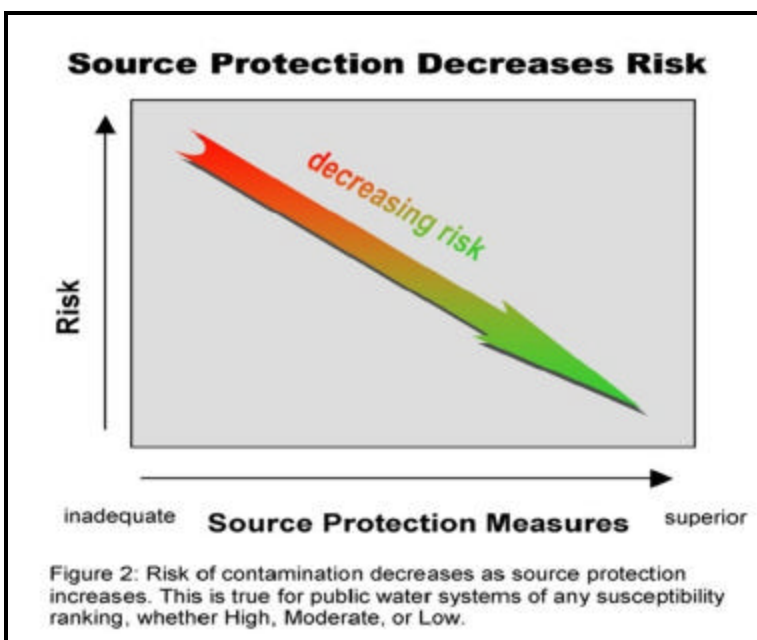
4. Federal Superfund Site and Oil or Hazardous Material Contamination Sites -

The IWPA for the South Street Wells contains a United States Environmental Protection Agency (USEPA) Superfund Site that is associated with a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 3-0000333. Refer to the attached map and Appendix 3 for more information.

The Superfund Site is the contributor to the historic contamination at the South Street Wells.

Federal Superfund Site and Oil or Hazardous Material Contamination Sites Recommendation:

(Continued on page 6)



Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (IWPA and Zones II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #/ Source ID #	Potential Contaminant Sources*
Agricultural				
Nurseries	1	M	222	Leaks, spills, improper handling, or over-application of fertilizers, pesticides, and other chemicals
Commercial				
Body Shops	1	H	222	Improper management of vehicle paints, solvents, and primer products
Gas Stations	2	H	222	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	1	H	222	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	3	H	IWPA	Spills, leaks, or improper handling of fuels and maintenance chemicals
Sand and Gravel Mining/ Washing	1	M	04G	Spills or leaks from heavy equipment, fuel storage, clandestine dumping
Industrial				
Asphalt, Coal Tar, and Concrete Plants	1	M	222	Spills, leaks, or improper handling or storage of hazardous chemicals and wastes
Electroplaters	1	H	222	Spills, leaks, or improper handling or storage of solvents and other chemicals
Hazardous Materials Storage	1	H	01G, 02G, 03G	Spills, leaks, or improper handling or storage of hazardous materials
Metal Plating	1	H	01G, 02G, 03G	Spills, leaks, or improper handling or storage of solvents, other chemicals, and process wastes
Residential				
Fuel Oil Storage (at residences)	100+	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care/Gardening	100+	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems/Cesspools	100+	M	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	3	M	All	Spills, leaks, or improper handling of materials stored in tanks

Land Uses	Quantity	Threat	Zone II #/ Source ID #	Potential Contaminant Sources*
Miscellaneous				
Large Quantity Hazardous Waste Generators	1	H	01G, 02G, 03G	Spills, leaks, or improper handling or storage of hazardous materials and waste
Oil or Hazardous Material Sites	1	--	01G, 02G, 03G	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Small Quantity Hazardous Waste Generators	2	M	01G, 02G, 03G, 04G	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/Retention Basins	100+	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Superfund Sites	1	H	01G, 02G, 03G	Spills, leaks, or improper handling or storage of oil or hazardous materials and waste
Underground Storage Tanks	1	H	All	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	2	L	222, 01G, 02G, 03G	Spills, leaks, or improper handling or storage of hazardous materials and waste
Waste Transfer/Recycling Station	1	M	222	Improper management, seepage, and runoff of water contacting waste materials
Table 2 Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>* THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

5. Protection Planning – Currently, the Towns of Holbrook and Randolph do not have a groundwater protection bylaw that meets DEP's Groundwater Protection regulations 310 CMR 22.21. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Other land uses and activities within the IWPA and Zone II are included in Table 2. Refer to Table 2 and Appendix 2 for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Randolph-Holbrook's IWPA's and Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above, and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the IWPA's and Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

- 1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- 2. MA DEP SWAP Strategy
- 3. Land Use Pollution Potential Matrix
- 4. Draft Land/Associated Contaminants Matrix

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES (Donna Road Well Site)	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
	NO (South Street Wells, Donna Road Tubular Wells)	To the extent possible, remove prohibited activities in Zone I to comply with DEP's Zone A requirements. Investigate options for gaining ownership or control of the Zone I.
Are the Zone Is posted with "Public Drinking Water Supply" Signs?	NO	Economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone Is regularly inspected?	NO	Wells are inactive and no longer inspected on a daily basis
Are water supply -related activities the only activities within the Zone I?	YES (Donna Road Well Site)	Monitor for any new non-water supply activities in Zone I, and investigate options for removing these activities.
	NO (South Street Well, Donna Road Tubular Wells)	Monitor prohibited activities in Zone I, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	N/A	
Planning		
Does the PWS have a wellhead protection plan?	NO	Develop and implement a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Address plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	Fire Department	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	NO	Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial and industrial uses within the IWPA and Zone II.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN RANDOLPH-HOLBROOK JOINT WATER BOARD WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
132531	ADOLPH BAUER INC	763 SOUTH ST	HOLBROOK	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
36865	BOSTON STEEL FABRICATORS INC	610 SOUTH ST	HOLBROOK	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
337999	CONTAINER RECYCLING ALLIANCE	620 SOUTH ST	HOLBROOK	DISCH	MWRA SEWER CONNECTION
317888	CVS #1251	790 SOUTH FRANKLIN ST	HOLBROOK	HANDLR	SMALL QUANTITY GENERATOR OF HAZ WASTE
359272	FOSTER SOUTHEASTERN INC	46 SPRING ST	HOLBROOK	PLANT	AIR QUALITY PERMIT
32442	HOLBROOK AUTO BODY	200 SOUTH ST	HOLBROOK	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
374229	HOLBROOK FOOD MART	855 SOUTH FRANKLIN ST	HOLBROOK	FULDSP	FUEL DISPENSER
136532	PINE HILL SERVICE STATION INC	776 SOUTH FRANKLIN ST	HOLBROOK	FULDSP	FUEL DISPENSER
326808	STEWARTS EQUIPMENT	670 SOUTH FRANKLIN ST	HOLBROOK	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
126830	SUNOCO SERVICE STATION	845 SOUTH FRANKLIN ST	HOLBROOK	HANDLR	VERY SMALL QUANTITY GENERATOR OF HAZ WASTE
132173	ACCURATE METAL FINISHING INC	414 SOUTH ST	RANDOLPH	HANDLR	LARGE QUANTITY GENERATOR RCRA HAZARDOUS WASTE
132173	ACCURATE METAL FINISHING INC	414 SOUTH ST	RANDOLPH	HANDLR	VERY SMALL QUANTITY GENERATOR WASTE OIL/PCBS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
132173	ACCURATE METAL FINISHING INC. - GREAT POND	414 SOUTH ST	RANDOLPH	TURRPT	LARGE QUANTITY TOXIC USER

UNDERGROUND STORAGE TANKS WITHIN RANDOLPH-HOLBROOK JOINT WATER BOARD WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
GRANT STEEL CO INC	2 MEAR RD	HOLBROOK	OTHER	8050	DIESEL
HOLBROOK FOOD MART	855 S FRANKLIN ST	HOLBROOK	GAS STATION	7820	GASOLINE
HOLBROOK FOOD MART	855 S FRANKLIN ST	HOLBROOK	GAS STATION	7820	GASOLINE
SUNOCO	845 S FRANKLIN ST	HOLBROOK	GAS STATION	10000	GASOLINE
SUNOCO	845 S FRANKLIN ST	HOLBROOK	GAS STATION	5000	GASOLINE
SUNOCO	845 S FRANKLIN ST	HOLBROOK	GAS STATION	5000	GASOLINE

FOR MORE INFORMATION ON UNDERGROUND STORAGE TANKS, VISIT THE MASSACHUSETTS DEPARTMENT OF FIRE SERVICES WEB SITE:
[HTTP://WWW.STATE.MA.US/DFS/UST/USTHOME.HTM](http://www.state.ma.us/dfs/ust/usthome.htm)

NOTE: THIS APPENDIX INCLUDES ONLY THOSE FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA(S) THAT MEET STATE REPORTING REQUIREMENTS AND REPORT TO THE APPROPRIATE AGENCIES. ADDITIONAL FACILITIES LOCATED WITHIN THE WATER SUPPLY PROTECTION AREA(S) SHOULD BE CONSIDERED IN LOCAL DRINKING WATER SOURCE PROTECTION PLANNING.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Randolph-Holbrook Joint Water Board Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN).

RTN	Release Site Address	Town	Contaminant Type
3-0000333	775 South St	Holbrook	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Raynham Center Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Raynham Center Water District
<i>PWS Address</i>	280 Pleasant Street
<i>City/Town</i>	Raynham, MA 02767
<i>PWS ID Number</i>	4245000
<i>Local Contact</i>	William Ward
<i>Phone Number</i>	(508) 824-0020

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

<i>Zone II #:230</i> <i>Susceptibility: High</i>	
<i>Well Name</i>	<i>Source IDs</i>
Johnson Pond well	4245000-01G

<i>Zone II #:442</i> <i>Susceptibility: High</i>	
<i>Well Names</i>	<i>Source IDs</i>
Nip well 2	4245000-03G
Nip well 1A	4245000-04G
Nip well 2A	4245000-05G
Nip well 2B	4245000-06G
Gushee Pond well #1	4245000-07G
Nip well 1B	4245000-08G
Gushee Pond well #2	4245000-09G

The Raynham Center Water District has eight wells: the Johnson Pond well; the Nip wells 1A, 1B, 2, 2A, 2B; and Gushee Pond wells 1 and 2. Each well has a Zone I of 400 feet and a Zone II that has been hydrogeologically determined. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zones I and II.

The water is treated to remove iron and manganese. It is also chlorinated and the pH is adjusted for corrosion control. For current information on treatment and the results of water quality monitoring, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs, #230 and #442, contain predominantly undeveloped forest, 33% and 47%, respectively. The Zone II for the Gushee Pond and Nip wells extends into Bridgewater. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Automobile Repair Shop
4. Gas Station
5. Transportation Corridors
6. Transmission Line Right-of-Way
7. Oil or Hazardous Material Release Sites
8. State Road Maintenance Depot
9. Aquatic Wildlife
10. Water Treatment Sludge Lagoons

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Land Uses Within Zone I – The Zone I for each of the wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) requires public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The Raynham Center Water Districts owns or controls all the Zone Is and there are no non-water supply activities occurring.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 49% and 16% of Zone IIs #230 and #442, respectively, consist of residential land uses. The Zone IIs also contain 33% and 47% forested, undeveloped land. A large portion of this forested land has the potential for more residential development. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use,

storage, and disposal of chemical products used in homes are potential sources of contamination.

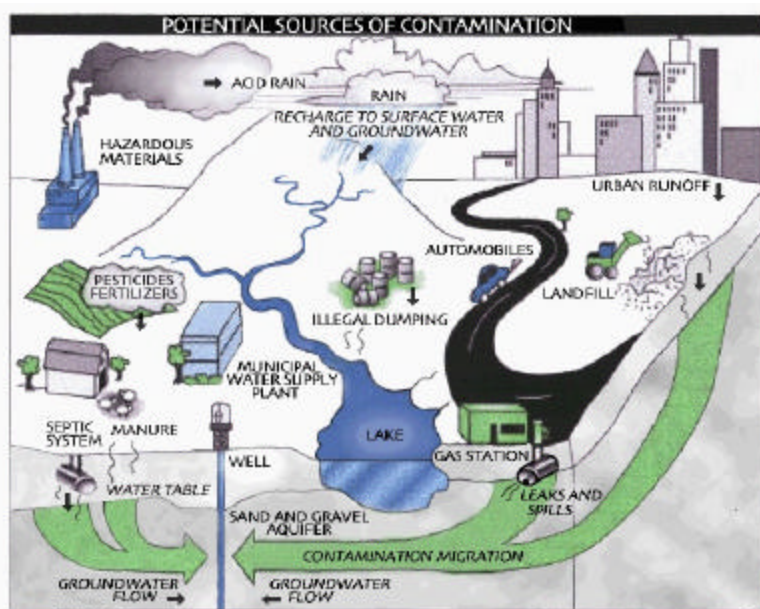
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Residential Land Use Recommendations:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas. See www.state.ma.us/envir/ to obtain information from the Massachusetts Executive Office of Environmental Affairs on build-out analyses for communities into which Zone IIs extend.
- ✓ Promote Best Management Practices (BMPs) for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Automobile Repair Shop - There is one automobile repair shop within the Zone II of the Nip and Gushee wells. Automotive fluids and solvents can leak or spill from this type of facility.

Service Station/Auto. Repair Shop Recommendation:

- ✓ Talk with the owner/operator about the water supply protection area and discuss the importance of proper handling, storage and disposal of fluids and solvents.

4. Gas Station - There is one gas station within the Nip/Gushee Zone II.

Gas Station Recommendation:

- ✓ Talk with the owner/operator about the water supply protection area and discuss the importance of proper handling, storage and disposal of fluids, solvents and fuel.

5. Transportation Corridors - Routes 495 and 24 run through the Zone II for the Nip and Gushee wells. Local roads run through both Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt,

automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage systems along transportation corridors. Wherever possible, ensure that drains discharge to outside the Zones I & II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zones I & II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

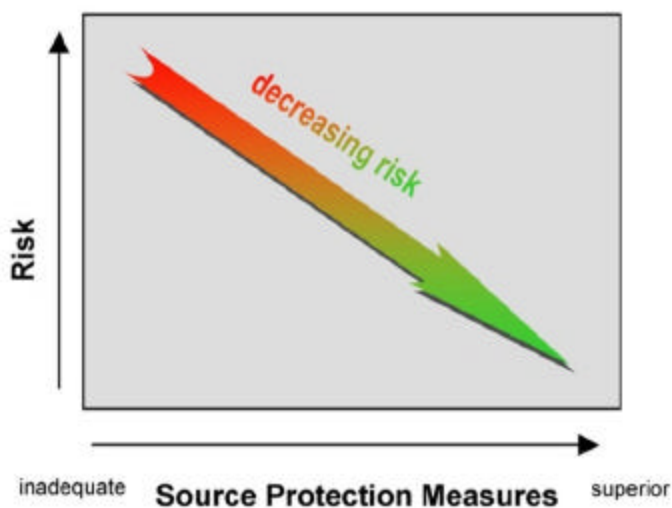


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential (Zone IIs 230 and 442)			
Septic Systems	many	M	microbial contaminants, improper disposal of hazardous chemicals
Fuel Oil Storage	many	M	spills, leaks or improper handling of fuel oil
Lawn Care	many	M	over-application of improper storage and disposal of pesticides
Commercial			
Automotive Repair Shop	1 in Zone II 230	H	leaks or spills of automotive fluids and solvents
Gas Station	1 in Zone II 442	H	leaks or spills of automotive fluids, solvents and fuels
Miscellaneous			
Transportation Corridors	Routes 495, 24 & local roads in 442; local roads in 230	M	leaks or spills of fuel and other hazardous materials; over-application or improper handling of pesticides; erosion from construction
Transmission Line Right-of-Way	1 in Zone II 442	L	spills from over-application or improper handling of pesticides, erosion from construction
DEP Tier Classified Oil or Hazardous Material Release Site	1 in Zone II 442	not ranked	see Appendix ____ for more information
State Road Maintenance Depot	1 in Zone II 442	M	spills of deicing materials; automotive fluids; fuel; other chemicals
Aquatic Wildlife (ducks & geese) on the Nip & on Johnson's Pond	Zones I & II of Nip & Johnson Pond wells (230 & 442)	L	microbial
Water Treatment Sludge Lagoons	Zone I of Nip wells	M	improper storage, handling & disposal of sludge and wastewater

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- * **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

6. Transmission Line - There is an electric utility line that runs through the Nip and Gushee Zone II.

Transmission lines are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Mass. Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed.

Transmission (Utility) Lines Recommendation:

- ✓ Monitor the YOP for pesticide application.

7. Oil or Hazardous Material Release Sites – A DEP Tier Classified Oil or Hazardous Material Release Site is located near the Nip wells. This is a site where illegal dumping once occurred. Refer to the accompanying GIS map and Appendix C for more information.

Oil/Hazardous Materials Recommendation:

- ✓ Monitor the status of this site. Distribute the fact sheet *Businesses Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.

8. State Road Maintenance Depot - There is a state highway department garage on Fruit Street near the Nip wells. These facilities may store and use deicing materials; automotive fluids; fuel; and other chemicals.

Maintenance Depot Recommendation:

- ✓ Meet with the facility operator to ensure that containment structures and spill response measures are in place in case of leaks or spills.

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



9. Aquatic Wildlife - There is aquatic wildlife, ducks and Canada geese, on Johnson's Pond and at the Nip wells.

Aquatic Wildlife Recommendations:

- ✓ Discourage feeding of the waterfowl.
- ✓ Post signs denoting the drinking water supply protection area.

10. Water Treatment Sludge Lagoons - There are seven sludge lagoons at the Nip wells.

Water Treatment Recommendation:

- ✓ Treatment chemicals and equipment maintenance materials at water supply facilities must be handled, storage, used and disposed of properly.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	Yes	The Raynham Center Water District meets DEP’s Wellhead Protection Best Effort requirement, 310 CMR 22.21(1)(d). The Town of Raynham has a water supply protection bylaw and a floor drain regulation that meets DEP’s Wellhead Protection regulations. The Water District has also made a best effort to contact the Town of Bridgewater about wellhead protection. See the highlighted note on page nine.
Do neighboring communities protect the Zone II areas extending into their communities?	NO Bridge-water	Continue to work with Bridgewater regarding wellhead protection.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Work with other local water systems to develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	NO	Work with the Town’s Local Emergency Planning Committee to develop a plan & conduct drills with local emergency response officials to test procedures.
Does the municipality have a wellhead protection committee?	NO	A committee can be helpful with implementing wellhead protection measures.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	
Does the PWS provide wellhead protection education?	NO - for security reasons	It would be productive to educate residents and businesses about water supply protection without having to describe the locations of the wells.

Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – Currently, the Raynham Center Water District meets DEP’s Wellhead Protection Best Effort requirement, 310 CMR 22.21(1)(d). The Town of Raynham has a water supply protection bylaw and a floor drain regulation that meets DEP’s Wellhead Protection regulations. The Water District has also made a best effort to contact the Town of Bridgewater about wellhead protection.

It is recommended that the District submit to DEP a copy of the Town’s Water Resource Overlay Protection District Map that presents evidence of coverage of the District’s DEP-approved Zone IIs to obtain compliance with the Wellhead Protection regulations, 310 CMR 22.21(2). The maps on file at DEP do not clearly show the coverage. Please contact Catherine Sarafinas at 617-556-1070 for more information.

A local Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan in coordination with the North Raynham Water District. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection:

As with many water supply protection areas, this system’s Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through

- ? working with the towns of Raynham and Bridgewater to protect the public wells and
- ? working with the Board of Health to conduct inspections of facilities.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly.
- ✓ Work with the North Raynham Water District to develop a wellhead protection plan.
- ✓ Educate residents on ways they can help protect drinking water.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zones I & II and to cooperate on responding to spills or accidents.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendix

- A. Source Protection Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Businesses Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
- B. List of Regulated Facilities
- C. Table of DEP Tier Classified Oil or Hazardous Material Release Sites

APPENDIX B:
REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
31333	Mastria	244 North Main St.	Raynham	Generator of Hazardous Waste	Small Quantity Generator
301430	FAR Inc.	1443 North Main St.	Raynham	Generator of Waste Oil or PCBs	Small Quantity Generator

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

For more location information, please see the attached map. The map lists the release sites by RTN.

RTN	Release Site Address	Town	Contaminant Type
4-0000458	244 North Main Street	Raynham	
4-0000520	1443 & 1450 North Main Street	Raynham	



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

North Raynham Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	North Raynham Water District
<i>PWS Address</i>	80 Baker Road
<i>City/Town</i>	Raynham, MA 02767
<i>PWS ID Number</i>	4245002
<i>Local Contact</i>	Arthur S. Bendinelli
<i>Phone Number</i>	(508) 824-0520

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
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A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

<i>Zone II #:331</i> <i>Susceptibility: High</i>	
<i>Well Name</i>	<i>Source IDs</i>
King Philip Street Well #1	4245002-01G
King Philip Street Well #2	4245002-03G
First Street Replacement Well	4245002-06G
<i>Zone II #:327</i> <i>Susceptibility: High</i>	
<i>Well Name</i>	<i>Source IDs</i>
King Philip Well #3A	4245002-04G
King Philip Well #3B	4245002-05G

The North Raynham Water District has five active wells: King Philip wells #1, 2, 3A and 3B and the First Street replacement well. Each well has a Zone I of 400 feet and a Zone II that has been hydrogeologically determined. The wells are located in the Taunton River basin. They have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map for the Zone II boundaries.

For current information on treatment and the results of water quality monitoring, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II (#327) for King Philip Street wells 3A & 3B is contained within Raynham. The Zone II (#331) for King Philip Street wells 1 & 2 and the First Street replacement well is located in Raynham and Taunton. The Zone IIs contain predominantly undeveloped forest, 64% and 36% respectively. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Automobile Repair Shop/Service Station
4. Gas Station
5. Transportation Corridors
6. DEP Tier Classified Oil Release Site
7. Storm Drains/Retention Basins
8. Golf Course
9. Paint Shop
10. Sand & Gravel Operation
11. Machine/Metalworking Shop
12. Very Small Quantity Hazardous Waste Generator
13. Underground Storage Tank
14. Composting Facility

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Land Uses Within Zone I – The Zone I for each of the wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The North Raynham Water District owns or controls all the Zone Is and there are no non-water supply activities occurring. The Water District conducts regular inspections and has signs posted. There have been issues with dirt bikes near King Philip Street well #2.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 26% and 22% of Zone IIs #327 and #331, respectively, consist of residential land uses. The Zone IIs also contain 64% and 36% forested, undeveloped land. A large portion of this forested land has the potential for more residential development. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination. Most of the residential areas in Raynham have been sewered.
- **Household Hazardous Materials** -

Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination. The Town recently conducted a Household Hazardous Waste Collection Day that was well attended.

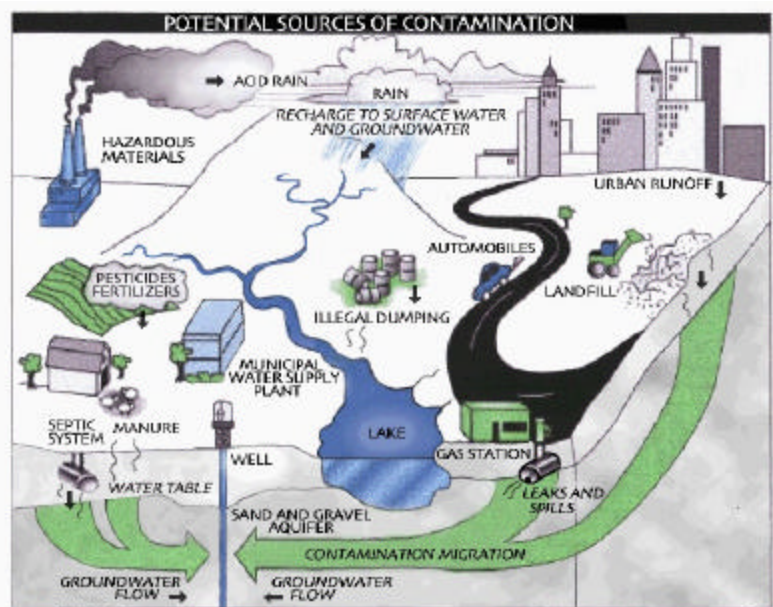
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with Municipal Planners in Raynham and Taunton to control new residential developments in the water supply protection areas. See www.state.ma.us/envir/ to obtain information from the Massachusetts Executive Office of Environmental Affairs on build-out analyses for Raynham and Taunton.
- ✓ Promote Best Management Practices (BMPs) for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.
- ✓ Encourage the Town of Raynham to continue conducting household waste collection days.

3. Automobile Repair Shop - There is one automobile repair shop within Zone II #331. Automotive fluids and solvents can leak or spill from this type of facility.

Service Station/Auto. Repair Shop Recommendation:

- ✓ Talk with the owner/operator about the water supply protection area and discuss the importance of proper handling, storage and disposal of fluids and solvents.

4. Gas Station - There is one gas station within Zone II #331.

Gas Station Recommendation:

- ✓ Talk with the owner/operator about the water supply protection area and discuss the importance of proper handling, storage and disposal of fluids, solvents and fuel.

5. Transportation Corridors -

Route 138 and local roads run through the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins. A railroad bed, currently without tracks, is also located in both Zone IIs.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage systems along transportation corridors. Wherever possible, ensure that drains discharge to outside the Zones I & II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

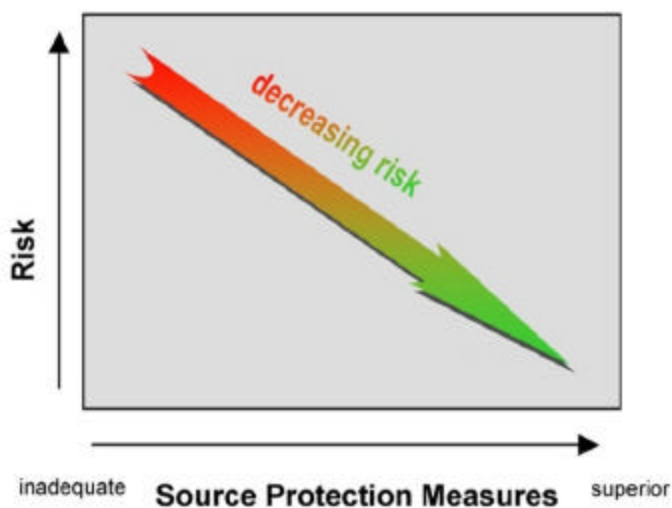


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential (Zone IIs 327 and 331)			
Septic Systems	several	M	microbial contaminants, improper disposal of hazardous chemicals
Fuel Oil Storage	several	M	spills, leaks or improper handling of fuel oil
Lawn Care	several	M	over-application of improper storage and disposal of pesticides
Commercial			
Automotive Repair Shop	1 in #331	H	leaks or spills of automotive fluids and solvents
Gas Station	1 in #331	H	leaks or spills of automotive fluids, solvents and fuels
Paint Shop	1 in #331	H	leaks or spills of paints, solvents, other chemicals
Golf Course	1 in #331	M	over-application or improper handling of fertilizers or pesticides
Sand & Gravel Operation	1 in #331	M	leaks or spills from equipment; fuel storage; clandestine dumping
Industrial			
Machine/Metalworking Shop	1 in #331	H	leaks or spills of solvents, metal tailings

Miscellaneous			
Very Small Quantity Hazardous Waste Generators	1 in #331	L	leaks or spills of hazardous materials or wastes
Storm Drains/Retention Basins	3 in each Zone II	L	debris, pet waste, chemicals in stormwater from roads, parking lots, lawns
Transportation Corridors	Rt. 138 & local roads –both Zone IIs	M	leaks or spills of fuel, other hazardous materials or pesticides
Composting Facility	1 in #331	L	runoff containing organic material and/or animal wastes
Underground Storage Tank	1 in #327	H	leaks or spills of stored materials
DEP Tier Classified Oil or Hazardous Material Release Sites	1 in #331 2 in #327	not ranked	see Appendix C for more information

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zones I & II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Check with the local Conservation Commission to determine whether pesticides are used on the railroad bed. The railroad utility is responsible for submitting a copy of their approved Vegetation Management Plan and Yearly Operating Plan to the Town if pesticides are used in the right-of-way. There are state regulatory setbacks and other requirements to help protect drinking water sources from pesticide over-application or spills.

6. Oil or Hazardous Material Release Site – A DEP Tier Classified Oil Release Site is located within Zone II #327. Refer to the accompanying GIS map and Appendix C for more information.

Oil/Hazardous Materials Recommendation:

- ✓ Monitor the status of this site. Distribute the fact sheet *Businesses Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.

7. Storm Drains/Retention Basins - There are three basins each within Zone IIs #327 and #331. Sediment, hazardous materials and microbial contaminants can be picked up by stormwater.

Storm Drains/Retention Basins Recommendation:

- ✓ Storm drains and retention basins should be cleaned out on a regular schedule so that they function properly.

8. Golf Course - A small golf course is located on Route 138 within Zone II #331. Fertilizers and pesticides can run off these sites or can be spilled through improper storage, use or disposal.

Golf Course Recommendation:

- ✓ Talk to the owner/operator about the location of the public wells and the importance of following good storage, use and disposal practices for fertilizers

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



and pesticides.

9. Paint Shop - There is one paint shop in Zone II #331.

Paint Shop Recommendation:

- ✓ Talk to the owner/operator about the location of the public wells and the importance of following good storage, use and disposal practices for chemicals.

10. Sand & Gravel Operation - An earth removal operation is located within Zone II #331.

Sand & Gravel Operations Recommendation:

- ✓ Talk with the owner/operator about the location of the public wells and about servicing equipment away from vulnerable areas and inspecting areas for clandestine dumping.

11. Machine/Metalworking Shop - There is one metalworking shop within Zone II #331.

Machine/Metalworking Shop Recommendation:

- ✓ Talk with the owner/operator about management practices for storing and handling solvents and other chemicals.

12. Very Small Quantity Hazardous Waste Generator (VSQHWG) - This

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town’s Aquifer Protection District Bylaw meets DEP’s requirements for wellhead protection. The District needs to show DEP that the bylaw covers the Zone IIs or make a best effort to have them covered.
Do neighboring communities protect the Zone II areas extending into their communities?	YES Taunton	Continue to work with Raynham and Taunton regarding wellhead protection.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Work with the Raynham Center Water District to develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	NO	Work with the Town’s Local Emergency Planning Committee to develop a plan & conduct drills with local emergency response officials to test procedures.
Does the municipality have a wellhead protection committee?	NO	A committee can be helpful with implementing wellhead protection measures.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	The Water District conducts inspections under the Cross Connection Service.
Does the PWS provide wellhead protection education?	YES - CCR	Educate residents on how <u>they</u> can protect drinking water.

facility is located within Zone II #331.

VSQHWG Recommendation:

- ✓ Talk with the owner/operator about good handling and disposal practices.

13. Underground Storage Tank (UST) - There is one underground storage tank documented within Zone II #327.

UST Recommendation:

- ✓ Ensure that the UST has a containment structure that will contain spills and leaks.

14. Composting Facility - There is one facility within Zone II #331. Runoff from compost may contain organic materials and/or animal wastes.

Composting Facility Recommendation:

- ✓ Talk to the owner/operator to ensure that runoff is properly contained and managed on-site.

Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – Currently, the Town of Raynham has a water supply protection bylaw that meets DEP's Wellhead Protection regulations, 310 CMR 22.21(2). The North Raynham Water District needs to demonstrate to DEP that the Town's Water Resource Protection District protects the Zone IIs for the District's wells. The Water District Superintendent reports that the City of Taunton protects the portion of Zone II #331 that extends into that community

A local Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan in coordination with the Raynham Center Water District. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Provide documentation to DEP that the Town of Raynham's Water Resource Protection District protects the District's wells or make a best effort to have Raynham include them in the bylaw.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Current Land Uses and Source Protection:

As with many water supply protection areas, this system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through

- ? working with the Town of Raynham to protect the public wells and
- ? conducting regular inspections and posting signs.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly.
- ✓ Continue to ask the Police Department to assist with security matters.
- ✓ Work with the Raynham Center Water District to develop a wellhead protection plan.
- ✓ Educate residents on ways they can help protect drinking water.
- ✓ Work with emergency responders to ensure that they are aware of the stormwater drainage in your Zones I & II and to cooperate on responding to spills or accidents.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Source Protection Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
- B. List of Regulated Facilities
- C. Table of DEP Tier Classified Oil or Hazardous Material Release Sites

APPENDIX B:
REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
31333	Mastria	244 North Main St.	Raynham	Generator of Hazardous Waste	Small Quantity Generator
301430	FAR Inc.	1443 North Main St.	Raynham	Generator of Waste Oil or PCBs	Small Quantity Generator

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Release Sites Within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000787	593 Broadway	Raynham	oil
4-0001101	184 and 242 and 252 Broadway	Raynham	oil
4-0010916	Broadway Rte 138	Raynham	oil and hazardous material
4-0017044	Broadway Rte 138	Raynham	oil

For more location information, please see attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Dorothy L. Beckwith Middle School

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

**SWAP and
Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Table 1: Public Water System (PWS) Information

PWS NAME	Dorothy L. Beckwith Middle School
PWS Address	330R Winthrop Street
City/Town	Rehoboth, MA 02769
PWS ID Number	4247002
Local Contact	Matthew Tobin
Phone Number	508-252-5025

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #2	02G	250	750	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
October 2003

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

Well #2 provides drinking water to approximately 800 students and adults at the Dorothy L. Beckwith Middle School. The well has a Zone I of 250 feet and an Interim Wellhead Protection Area (IWPA) of 750 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (school, parking)
2. Athletic Fields
3. Residential
4. Transportation Corridor – Route 44

The overall ranking of susceptibility to contamination for the well is MODERATE based on the presence of at least one MODERATE threat within the Zone I and IWPA.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
School, Parking	Yes	Yes	M	leaks or spills from fuel oil; chemicals from laboratories, art & photographic studios, machine shop; runoff from parking lot
Athletic Fields	No	Yes	M	over-application of pesticides & fertilizers
Residential	No	Yes	M	spills or leaks from fuel delivery & storage; microbial contaminants from septic systems; pesticides and fertilizers from lawn care
Transportation Corridor – Route 44	access road	Yes	M	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Zone I** – The public water system owns or controls the entire Zone I and posts water supply awareness signs. Part of the school and parking spaces are located within the Zone I. The public water system does not meet DEP's Zone I requirements because of non-water supply activities within the Zone I.

Recommendations

- ✓ As much as possible, keep non-water supply activities out of the Zone I.
- ✓ Do not use pesticide, fertilizers or de-icing materials within the Zone I.

2. **Athletic Fields** – There are athletic fields within the IWPA. Spills or over-application of pesticides or fertilizers are potential sources of contamination.

Recommendation

- ✓ Minimize the use of pesticides and fertilizers within the IWPA.

3. **Residential** – Nine percent of the Zone I and IWPA consist of residences. The following activities are potential contaminant sources associated with residential land uses.

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Recommendation:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

4. **Transportation Corridor** – A portion of Route 44 is located within the IWPA. Leaks and spills, vehicular accidents, and over-application or spills of pesticides are potential sources of contamination. In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

Recommendations:

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.
- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

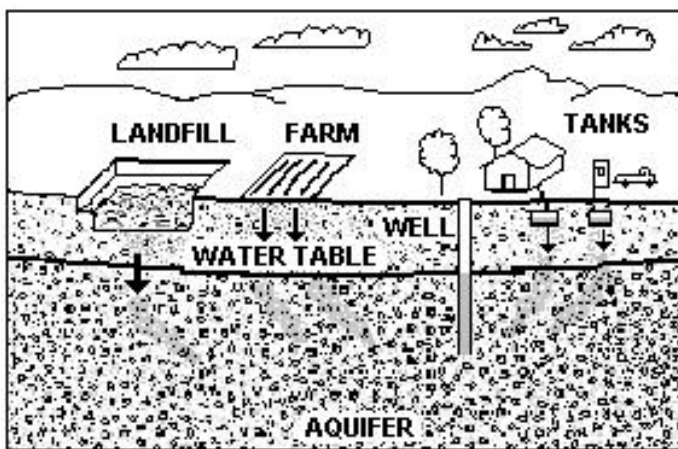


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. School and town administrators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Inspect the Zone I.

Training and Education

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.
- ✓ Educate staff and students on the proper use and disposal of chemicals and other substances.
- ✓ Incorporate water supply protection information into school curriculum.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Review the enclosed *Healthy Schools* fact sheet.

Planning

- ✓ Work with town officials to improve water supply protection.

Funding

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- Healthy Schools fact sheet
- Residents Protect Drinking Water fact sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For North Rehoboth School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
November 2003

Table 1: Public Water System (PWS) Information

PWS NAME	North Rehoboth School
PWS Address	Tremont Street
City/Town	Rehoboth, MA 02769
PWS ID Number	4247004
Local Contact	Mathew Tobin
Phone Number	(508) 252-5000

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	100	408	moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

The North Rehoboth School receives its drinking water from a groundwater well located adjacent to the school. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 408 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **septic system;**
3. **residential development; and**
4. **vehicle parking.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate threats within the Zone I and IWPA.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I contains part of the school building and vehicle parking. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct stormwater drainage outside of Zone I.
- ✓ Develop an integrated Pest Management (IPM) plan to reduce fertilizer and pesticide use. Visit <http://www.state.ma.us/dfa/cpa/ipmplan.htm> for information on developing an IPM plan.

2. **Septic System** – The septic system for the school is located within the IWPA.

Recommendation:

- ✓ Septic system components should be inspected and maintained on a regular basis.
- ✓ Never dispose of hazardous materials into septic system.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
school	Yes	Yes	Moderate	solvents & other materials used in classrooms
parking lot	Yes	Yes	Moderate	stormwater runoff, spills
lawn/playing fields/playground	No	Yes	Moderate	fertilizer and pesticide use
septic system	No	Yes	Moderate	bacteria, improper disposal of hazardous materials
residential development	No	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks
portion of road	No	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

3. Residential Development – There is low density residential development within the IWPA.

Recommendation:

- ✓ Educate residents in the IWPA about water supply protection. Include material on septic system operation and maintenance, proper hazardous materials handling including heating fuel storage, and proper lawn care practices.

4. Vehicle parking and road – School parking is within the Zone I and part of Tremont Street is within the IWPA. Runoff and spills from vehicle parking and roads can contaminate public wells.

Recommendation:

- ✓ Map stormwater drainage and direct drainage away from the Zone I.
- ✓ Continue to maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. School officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a

threat to the water supply.

- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

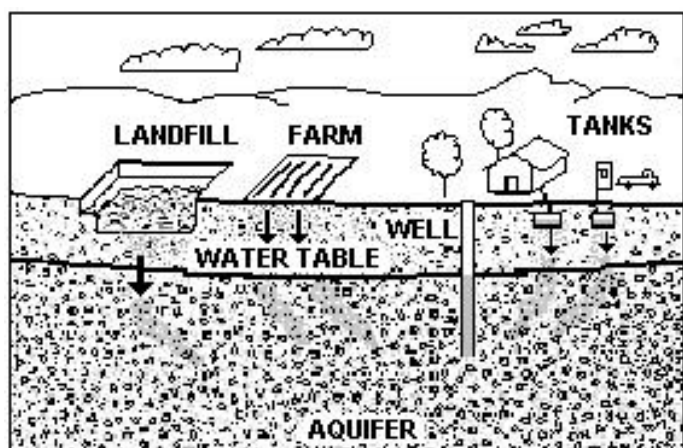


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Cedar Brook School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
November 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Cedar Brook School
PWS Address	24 Ralsie Road
City/Town	Rehoboth, Massachusetts 02769
PWS ID Number	4247028
Local Contact	William Barton
Phone Number	(800) 340-6041

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	100	417	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Cedar Brook School is located adjacent to the school. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 417 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **above ground storage tank (AST) with heating oil;**
3. **septic system;**
4. **residential development; and**
5. **road.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate ranked threats within the Zone I and IWPA.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I contains part of the school building, lawns, and driveway turn-around. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct roadway stormwater drainage out of Zone I.
- ✓ Ensure no new non-water supply activities are allowed in the Zone I.

2. **Aboveground Storage Tank (AST)** – There is a heating fuel oil AST with containment located within the IWPA. If managed improperly, above ground storage tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Inspect and maintain the integrity of the containment structure.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
school	Yes	Yes	Moderate	solvents & other materials used in building operation and maintenance and classroom activities.
lawn	Yes	Yes	Moderate	fertilizer and pesticide use
above ground storage tank	No	Yes	Moderate	leaks, spills
septic system	No	Yes	Moderate	bacteria, improper disposal of hazardous materials
residential development	No	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks
portion of road	Yes	Yes	Moderate	stormwater runoff, spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

3. **Septic System** – The septic system for the school is located within the IWPA.

Recommendation:

- ✓ Septic system components should be inspected and maintained on a regular basis.
- ✓ Never dispose of hazardous materials into septic system.

4. **Residential Development** – There are two houses located within the IWPA.

Recommendation:

- ✓ Educate residents in the IWPA about water supply protection including proper septic system maintenance, lawn care, AST dangers and hazardous materials handling.

5. **Road** – Part of the school driveway and turn-around is within the Zone I and IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Continue to maintain contact with the Fire Department about spills.
- ✓ Minimize use of deicing agents in Zone I and IWPA.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Cedar Brook School is commended for using an above ground tank with containment for its heating fuel oil. School officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping or evidence of

vandalism.

- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).

Facilities Management:

- ✓ Inspect and maintain the integrity of the containment

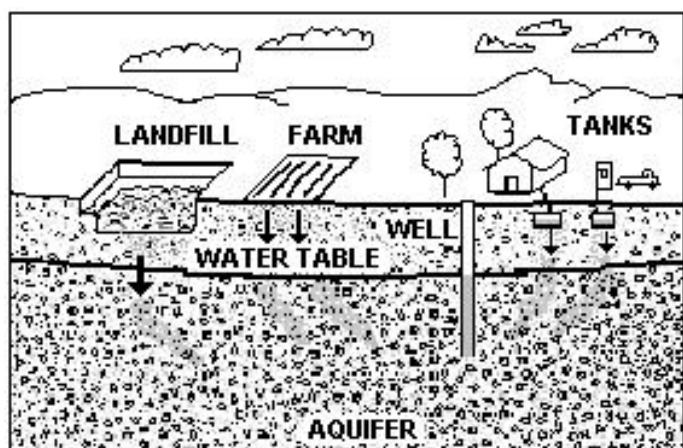


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

structure for the AST.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

6. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Source Protection Sign Order Form

Source Water Assessment Program (SWAP) Report

For

Rochester Memorial School



Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
February 6, 2001

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Rochester Memorial School
<i>PWS Address</i>	16 Pine Street
<i>City/Town</i>	Rochester, Massachusetts
<i>PWS ID Number</i>	4250002
<i>Local Contact</i>	Principal, Jay Ryan
<i>Phone Number</i>	508-763-2049

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4250002-01G	187	484	High

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

Maintaining Your Good Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the water system
2. Discussion of land uses within protection areas
3. Recommendations for protection
4. Attachments: including Map of the protection area(s)

1. DESCRIPTION OF THE WATER SYSTEM

The Well

The Rochester Memorial School is a public water system with a single water supply well currently serving a population of 509 students, 72 teaching staff and approximately 10 police and fire Department personnel. The well is located in a below ground concrete vault south of the school's main entrance. The well is 6 inches in diameter and is drilled to a depth of 70 feet. Well #1 has a Zone I of 187 feet and an Interim Wellhead Protection Area (IWPA) of 484 feet. The well is located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of a hydrogeologic barrier that can prevent contaminant migration. Please refer to the attached Map of the Zone I and IWPA.

The Water Quality

The well serving the facility is treated by a limestone contactor. The limestone contactor is designed to raise the pH of the water to reduce its corrosiveness. For current

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

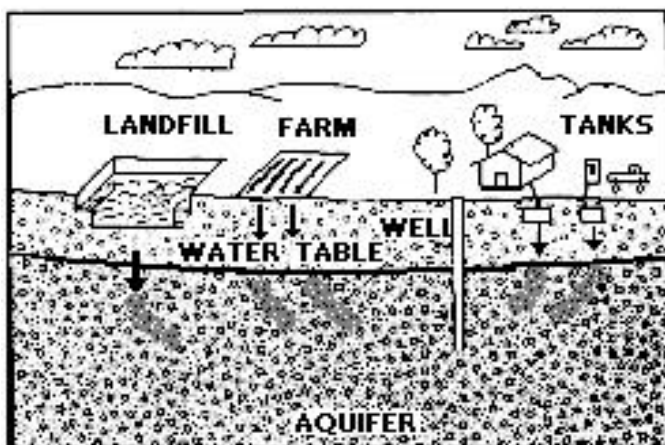


Figure 1: Example of how a well could become contaminated by different land uses and activities.

information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

Future Considerations

The school recently purchased approximately eight acres of land in close proximity to the school, which may provide a location for a new water source with the appropriate protective radii. Any proposed expansion of use of the system will require a new water supply subject to Department approval. This will become necessary if the school plans to expand.

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone 1;**
2. **An Aboveground Storage Tank (AST) with Heating Oil; and**
3. **A Floor Drain within the Zone 1 with a Potential for Discharge of Petroleum Hydrocarbons/ Hazardous Waste to the Ground.**

The overall ranking of susceptibility to contamination for the well is **High**, based on the presence of at least one **High** threat land use or activity in the IWPA.

ZONE I:

1. **Zone I-** Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The public water supplier does not own and/or control all land encompassed by the Zone I. The facility's Zone I contains school buildings, police and fire department buildings, roads, parking areas, a residence, and school playground. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendation:

- ✓ Remove all non-water supply activities from Zone I to comply with DEP's Zone I requirements. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying system.
2. **Aboveground Storage Tank** – A heating oil AST without secondary containment is located inside the fire department garages within the Zone I.

Recommendation:

- ✓ Remove or relocate the AST from the Zone I, or provide 110% secondary containment for the AST. Comply with all provisions of the regulations regarding AST. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, local regulations and fire code requirements.

3. **Floor Drain** - Floor drains that ultimately lead to the soil via a dry well or septic system are prohibited. A floor drain was observed within the Fire Department garages within the Zone I. The ultimate discharge location for this floor drain is unknown. The floor drain at the fire station is a concern due to the storage of heating oil, gasoline, vehicle storage and maintenance, vehicle washing and other chemical storage.

Recommendation:

- 3 Bring the floor drain into compliance with DEP's

Table 2: Table of Activities within the Water Supply Protection Areas

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Fuel Storage Below Ground	No	Yes	High	Heating oil tank
Fire Station	Floor Drain	Yes	Yes	High	Hazardous materials stored in vicinity
School	Parking lot, driveways & roads	Yes	Yes	Moderate	Limited road salt usage and drainage away from wells
School	Athletic Field	No	Yes	Moderate	Fertilizer and pesticide use
	Cemetery	No	Yes	Moderate	
School	Septic System	No	Yes	Moderate	Refer to septic systems brochure
School & Fire Station	Fuel Storage Above Ground	Yes	Yes	Moderate	Tank does not have secondary containment
Residential	Lawn care/gardening	No	Yes	Moderate	One residence
Residential	Septic systems	No	Yes	Moderate	One residence

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:
www.state.ma.us/dep/brp/dws.

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

Regulations (refer to attachment 4 -*Industrial Floor Drain Brochure*).

- Contact the UIC coordinator for the Southeast Region Office of the Department for additional technical assistance (Mark Dakers Tele. #508-946-2847).

Interim actions:

- Cease using the floor drain
- Determine the discharge point of the floor drain

Rochester Memorial school should review and adopt the **key** recommendations above for the potential sources of contamination identified in the **Zone I**.

In addition to the potential sources of contamination identified within the Zone I, there are additional potential sources of contamination in the IWPA.

IWPA:

- ✓ **Underground Storage Tank (UST)** - There is an UST containing heating oil located within the IWPA. The UST is located west of the school just outside the main entrance. The UST is 12,000 gal. fiberglass double wall tank with leak detection and overfill protection which was installed in 1989-1990. An UST in the IWPA containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel.
- ✓ **Hazardous materials** - The facility currently participates with the Town of Rochester in its household hazardous waste collection to discard many of its spent chemicals. Staff should be trained on proper transportation and disposal of hazardous materials.
- ✓ **AST-** There is a backup diesel generator with a 330 gal. aboveground storage tank approximately 450 feet from the well inside the school building.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- ✓ **Septic system leaching field** The septic system leach field is located within the IWPA.

3. PROTECTION RECOMMENDATIONS

Implementing protection measures and best management practices (BMPs) will reduce the wells susceptibility to contamination. The Rochester Memorial School is commended for its current protection measures. Rochester Memorial School should review and adopt the **key recommendations above** and the following recommendations.

Zone I:

- 3 Continue to not use or store pesticides, fertilizers or road salt within Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material disposal, transportation, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff.
- 3 Drinking water protection area signs were not posted at the time of the site visit. The Department recommends systems post drinking water protection area signs at key visibility locations.

Facilities Management:

- 3 Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/brp/dws/dwspubs.html.
- 3 Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on the school property. To learn more, refer to the attached Fact Sheets "Protecting Water Sources from Fertilizer" and "Protecting Groundwater from Pesticides".
- 3 Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- 3 Eliminate discharge of non-sanitary wastewater to on-site septic systems. Instead, discharge any floor drains in areas using hazardous materials to a DEP approved tight tank.
- 3 The septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Planning:

- 3 Work with local officials in Rochester to include the school IWPA in Aquifer Protection District Bylaws and other regulations and to assist you in improving protection.
- 3 Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information please refer to the attached program fact sheet from last year (Please note each program year the Department posts a new Request for Response for the Grant program (RFR)).

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur

discussion of local drinking water protection measures.

4. ATTACHMENTS

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Fertilizer Use Factsheet
- Wellhead Protection Grant Program (fact sheet)
- Source Protection Sign Order Form

Source Water Assessment Program (SWAP) Report For Old Colony Regional Vocational Technical School



Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
March 20, 2001

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Old Colony Regional Vocational Technical School
<i>PWS Address</i>	476 North Avenue
<i>City/Town</i>	Rochester, MA
<i>PWS ID Number</i>	4250003
<i>Local Contact</i>	Thaomas Reznekevitz
<i>Phone Number</i>	(508) 763-8011 extension 115

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4250003-01G	300	879	HIGH

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

INTRODUCTION

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Old Colony Regional Vocational Technical School is a public water supply currently serving a population of 535 students and 98 teaching staff. The well for the Old Colony Regional Vocational Technical School is located in a below ground concrete vault east of the school. The well is 8 inches in diameter and is drilled to a depth of 250 feet. The well is located in a wooded area adjacent to the rear parking lot. Well #1 has a Zone I of 300 feet and an Interim Wellhead Protection Area (IWPA) of 879 feet. Please refer to the attached map of the Zone I and IWPA. The well is located in a bedrock aquifer with a high vulnerability to contamination due to the absence of a hydrogeologic barrier that can prevent contaminant migration. Emergency power is provided by a natural gas powered generator.

A sump pump and a heater were added to the concrete well vault during the year 2000. A crack in the well's concrete seal was repaired to prevent surface water and ground water

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

infiltration.

The well serving the facility has no treatment at this time. For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination. The buildings and grounds staff are commended for the actions they took to protect the water supply subsequent to the SWAP site visit. In a February 8, 2001 letter to the Department, the buildings and grounds staff indicated they have sealed the floor drain, labeled the waste oil tank, and prepared maintenance log sheets for the floor drain, oil/water separator and holding tank associated with the automotive garages. Additionally, staff has indicated they will solicit quotes for secondary containment for the two aboveground storage tanks.

Key issues include:

1. **Inappropriate activities in Zone I.**
2. **A 200-gallon AST for No. 2 diesel fuel and floor drain in IWPA.**
3. **Hazardous waste/materials storage in the IWPA.**
4. **Potential discharge of Industrial Wastewater to the septic system.**
5. **Floor drain connected to an Underground Storage Holding Tank (UST).**
6. **Aboveground Storage Tank (AST) for waste oil in IWPA.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I**— The school owns all the land encompassed by the Zone I. However, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains parking areas for approximately 40 vehicles. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. The storm water for the parking lot located in the Zone I is directed away from the well through two (2) catch basins on the northeast and southeast corners of the parking lot. The two-(2) catch basins are interconnected by a pipe which routes storm water approximately 200-300 feet to the north-northeast of the parking lot to a wooded area. Based on the site visit conducted during the SWAP assessment it

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Table 2: Table of Activities within the Water Supply Protection Areas

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	Underground Storage Tank and Floor Drain	No	Yes	High	Holding tank for floor drains in automotive shop garage
School	Floor Drain	No	Yes	High	Floor Drain has been sealed
School	Storage/use of oil & hazardous materials	No	Yes	High	Hazardous waste/materials storage
School	Parking lot, driveways & roads	Yes	Yes	Moderate	No road salt usage in Zone I and storm water drainage is away from well
School	Athletic Field and structures	No	Yes	Moderate	Fertilizer and Pesticide use
School	Septic System	No	Yes	Moderate	Refer to septic systems brochure in the attachments
School	Fuel Storage Above Ground	No	Yes	Moderate	Waste oil tank and 200 gallon diesel Tank without secondary containment
Residence	Septic systems, heating fuel storage, lawncare, gardening	No	Yes	Moderate	6 residences

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

appeared some stormwater infiltrated at the two-(2) catch basin locations. During heavy rainfall events the storm water which did not infiltrate at the two-(2) catch basin locations was discharged to the north-northeast of the parking lot. All catch basins and storm water drains are checked, cleared and maintained on a regular basis by the grounds keeping staff at the facility. According to school staff road salt is not used on the parking area located within the Zone I.

Recommendations:

- v Keep non-water supply activities out of the Zone I. Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying their system.
- v Continue to inspect and maintain catch basins and storm water structures for the parking lot located in Zone I.

2. **The Maintenance Building: Aboveground Storage Tank and Floor Drain-**a # 2 diesel 200 AST without secondary containment is located in the maintenance garage within the IWPA. Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in area large enough to hold the complete liquid volume, should a spill occur. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. The Department recommends that you consult with the local fire department for any additional local code requirements regarding AST. If you need to store fuel to power pumps, the drinking water program recommends that you consider using alternative fuels, such as natural gas or propane.

Recommendation implemented

In a Feb. 8, 2001 letter to the Department, buildings and ground staff indicated that they would solicit quotes for secondary containment for the diesel tank for the 2003-operating budget.

A floor drain was observed within the maintenance building during the site visit. The floor drain in the maintenance building is a concern due to the storage of diesel fuel AST, gasoline, fertilizer, pesticides, vehicle storage and other chemical storage.

Recommendation implemented

In a February 8, 2001 letter to the Department, the buildings and grounds staff indicated the floor drain has been subsequently sealed to comply with the

Department's regulations regarding Underground Injection Control (UIC).

3. **Hazardous Materials/Waste** – Hazardous materials as well as hazardous waste generated at the school is stored in a building (in close proximity to the maintenance garage) which is located approximately 400 feet from the well. A hazardous waste disposal contractor is hired to dispose of hazardous waste that accumulates.

Recommendation:

- v The school is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine your status and regulatory requirements. Enclosed is a registration form for you to fill out and return to the Department.

4. **Industrial Wastewater-** Discharge from photographic, art, science, and vocational classrooms is required to go to a

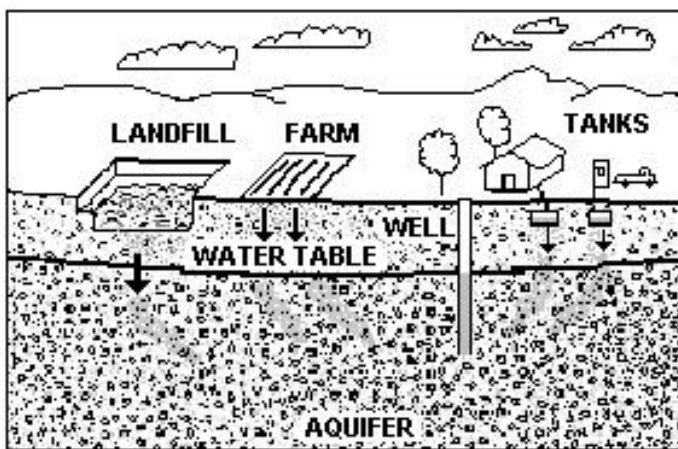


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at:
www.state.ma.us/dep/brp/dws.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, the town library and the local media.

tight tank or sewer.

Recommendation:

- ▼ Eliminate non-sanitary wastewater discharges (no discharge of industrial wastewater to sink) to on-site septic systems.

5. **Floor Drain, oil water separator and Underground Storage Tank** - A floor drain was observed within the automotive repair garages within the IWPA. The floor drains lead to an oil water separator that is connected to a 2000 gallons UST holding tank. The holding tank has an active alarm at 60 percent capacity and is located approximately 600 feet from the well. Automotive repair and maintenance occurs in the garages. An UST in the IWPA is a concern due to the potential threat posed by the release of its contents if managed improperly.

By their nature oil/water separators require regular maintenance. If not properly maintained they fail to function as intended and may cause significant problems. The frequency of the maintenance will depend on the particular facility. Maintenance plans should identify owners, parties responsible for maintenance, and an inspection and maintenance schedule. The Department recommends that a monitoring log detailing inspection and maintenance of the oil water separator be kept on the premises. At a minimum, inlets should be inspected and cleaned out four times per year and inspected monthly. Please note the recommendations, noted above; do not supersede any conditions imposed by the Board of Health.

Recommendation implemented

Subsequent to the SWAP site visit, the buildings and grounds staff has developed preventative maintenance plan and log sheets.

6. **Aboveground Storage Tank** - A waste oil AST is located inside the automotive repair garages within the IWPA. The waste oil tank should be labeled clearly (refer to attachment "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE").

Recommendation implemented

The waste oil tank has been labeled, as noted in the Feb. 8, 2001 correspondence from the buildings and grounds staff.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Old Colony Regional Vocational Technical School is commended for its current protection measures. The Old Colony Regional Vocational Technical School should review and adopt the **key** recommendations above and the following recommendations.

The Zone I:

- ▼ Continue to prohibit public access to the well and pumphouse by locking facilities and posting signs.
- ▼ Continue to conduct regular inspections of the Zone I. Look for illegal

dumping, evidence of vandalism, check any above ground tanks for leaks, etc.

- ▼ Continue not using or storing pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ▼ For additional help regarding environmental requirements and toxic use reduction approaches to compliance contact the Office of Technical Assistance for Toxic Use Reduction (OTA) reduce the use of toxic materials and reduce or eliminate omissions of toxic byproducts. The OTA is a nonregulatory agency within the Commonwealth's executive office environmental affairs. OTA provides free, confidential assistance on toxic use reduction opportunities (Refer to attachment for additional information).
- ▼ Train staff on proper hazardous material use, disposal, emergency response, and Best Management Practices; include custodial staff, groundskeepers, certified operator, and food preparation staff.

- ▼ Post drinking water protection area signs at key visibility locations.

Facilities Management:

- ▼ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/brp/dws/dwspubs.html.
- ▼ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ▼ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ▼ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ▼ Concrete pads should slope away from well and well casing should extend above ground.
- ▼ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ▼ Work with local officials in Rochester to include the schools IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ▼ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ▼ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ▼ These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the 2001 "Wellhead Protection Grant Program". For additional information please refer to the attached program fact sheet for 2001 (Please note each program year the Department posts a new Request for Response for the Grant program (RFR)).

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Wellhead Protection Tips for Small Public Water Systems
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure
- Summary of Requirements for Small Quantity Generators of Hazardous Waste
- Massachusetts Department of Environmental Protection-Generator Registration
- Healthy Schools Fact Sheet
- Chemical Management and Other Environmental, Health and Safety Issues in Schools
- Recycled and Environmentally Preferable Products and Services Guide for Commonwealth of Massachusetts State Contracts
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- OTA pamphlet



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For **SEMASS**

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	SEMASS Resource Recovery Facility
PWS Address	141 Cranberry Highway
City/Town	Rochester, MA 02770
PWS ID Number	4250007
Local Contact	Matthew Sears
Phone Number	508-291-4400

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	100	400	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for SEMASS is located adjacent to the facility. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 400 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. The IWPA is 80% forested and 20% industrial land use. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well serving the facility is treated with an ortho/polyphosphate blend primarily for corrosion control and secondly for iron and manganese removal. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Zone I issues;**
2. **waste to energy facility/waste incinerator/LQG/LQTU; fuel distribution**
3. **stormwater (culvert);**
4. **aquatic wildlife;**
5. **transmission line; and**
6. **DEP Tier Classified Oil/Hazardous Material Release Sites.**

The overall ranking of susceptibility to contamination for the well is HIGH based on the presence of at least one HIGH ranking in Table 2.

1. **Zone I** – The public water system owns or controls, and maintains only water supply activities within, the Zone I. The system conducts inspections, posts water supply protection signs and has installed a fence for security purposes.

Recommendations:

Continue with protection measures.

2. **Waste to energy facility/waste incinerator/Large Quantity Hazardous Waste Generator (LQG)/Large Quantity Toxic User (LQTU)** – SEMASS is a waste to energy facility. Parts of the facility are located within the IWPA. The system reports that there are no wastes stored in the IWPA. All employees are trained

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
solid waste landfill; waste incinerator; LQG; LQTU; fuel oil distribution	Yes	Yes	H	leaks or spills of toxic or hazardous materials & wastes & fuels
stormwater (culvert)	No	Yes	L	nutrients, debris, pet wastes, chemicals
transmission line	No	Yes	L	over-application or spills of pesticides
aquatic wildlife	No	Yes	L	microbial contaminants

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

annually in emergency response.

Recommendation:

Continue to conduct BMPs related to handling, storage, use and disposal of hazardous or toxic materials and wastes.

3. **Stormwater (culvert)** – A culvert is located within the IWPA. Stormwater can carry nutrients, debris, chemicals and other contaminants.

Recommendation:

Use best management practices to control and filter stormwater runoff.

4. **Aquatic Wildlife** – Aquatic wildlife from a nearby pond sometimes stray into the IWPA.

Recommendation:

Keep aquatic wildlife away from the well.

5. **Transmission Line** – There is a transmission line located within the IWPA. If pesticides are used to manage vegetation, the potential for spills, leaks or over-application exists.

Recommendation:

Be aware of how vegetation is managed on the right-of-way.

6. **DEP Tier Classified Oil or Hazardous Material Release Sites** – these are located at the SEMASS site.

Recommendations:

Reduce the use of oil or hazardous materials.

Use BMPs for storing, handling and disposing of these materials.

Install and maintain spill containment structures.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Recommendations for Protection

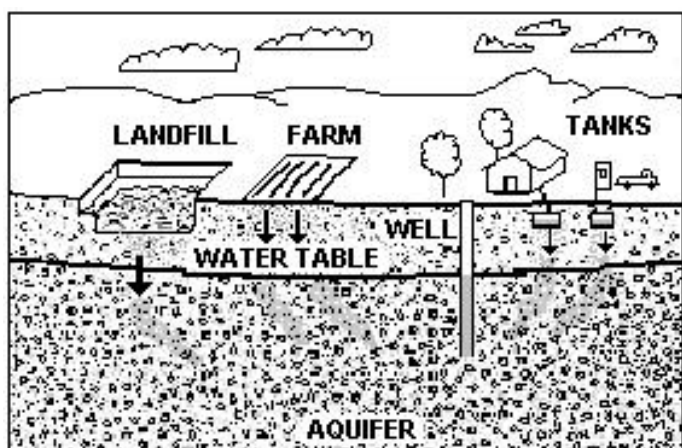


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Implementing protection measures will reduce the well's susceptibility to contamination. SEMASS is commended for conducting inspections, posting signs and keeping non-water supply activities out of the Zone I. Facility operators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Continue to train employees on the proper use, handling, storage and disposal of hazardous materials and wastes.

Facilities Management:

- ▼ inspect and maintain the integrity of any spin containment structures.

Planning:

- ✓ Work with local officials in town to make sure that SEMASS's IWPA is included in the local Aquifer Protection District Bylaw and to assist you in improving protection.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glpgrgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures fact sheet
- Source Protection Sign Order Form

Copies of this assessment have been made available to the public water supplier and town boards.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Sandwich Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Sandwich Water District
<i>PWS Address</i>	72 Tupper Road
<i>City/Town</i>	Sandwich
<i>PWS ID Number</i>	4261000
<i>Local Contact</i>	Daniel Mahoney
<i>Phone Number</i>	(508) 888-2775

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

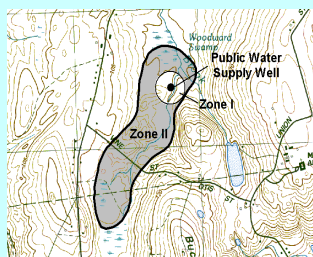
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II # 42

Susceptibility: High

Well Name	Source ID
Gravel Packed Well No. 5	4261000-05G
Gravel Packed Well No. 7	4261000-07G
Gravel Packed Well No. 8	4261000-08G
Gravel Packed Well No. 11	4261000-11G

Zone II # 135

Susceptibility: High

Well Name	Source ID
Gravel Packed Well No. 2	4261000-02G
Gravel Packed Well No. 3	4261000-03G
Gravel Packed Well No. 9	4261000-09G

Zone II # 211

Susceptibility: High

Well Name	Source ID
Gravel Packed Well No. 4	4261000-04G
Gravel Packed Well No. 6	4261000-06G
Gravel Packed Well No. 10	4261000-10G

The ten wells for Sandwich Water District are located throughout Town. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Potassium hydroxide is added to all active wells for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact persons listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs are a mixture of residential, commercial, and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses

3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Gasoline/service stations and auto repair shops
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The eleven (11) Zone Is for the Sandwich wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. Sandwich is commended for meeting DEP's Zone I requirements at all of their wells.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Ensure to keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 20% of the Zone IIs consist of residential areas. None of the areas have public sewers; therefore, all use on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential

source of microbial contamination.

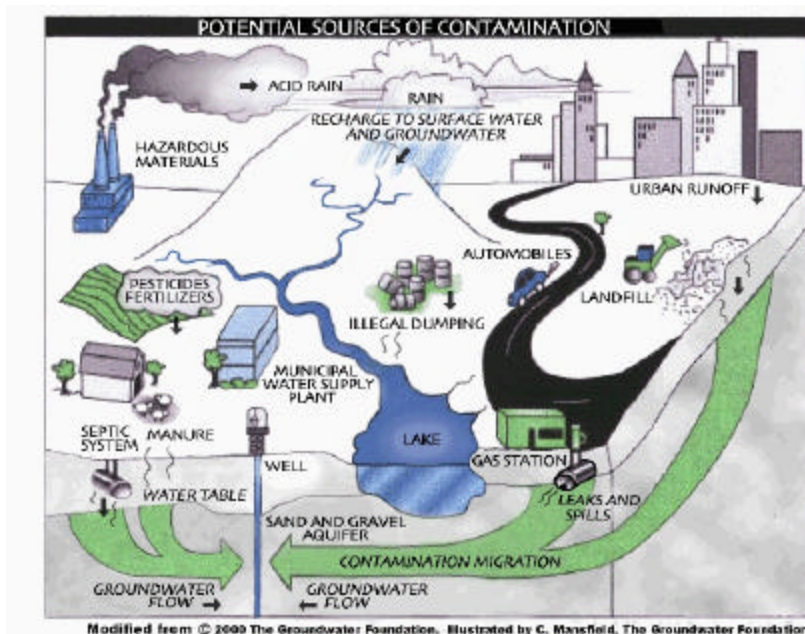
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 6 runs through Zone IIs #42 and #135 and Route 130 runs through all three Zone IIs. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with

emergency response teams.

- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use –

Small areas of the Zone IIs are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed of, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

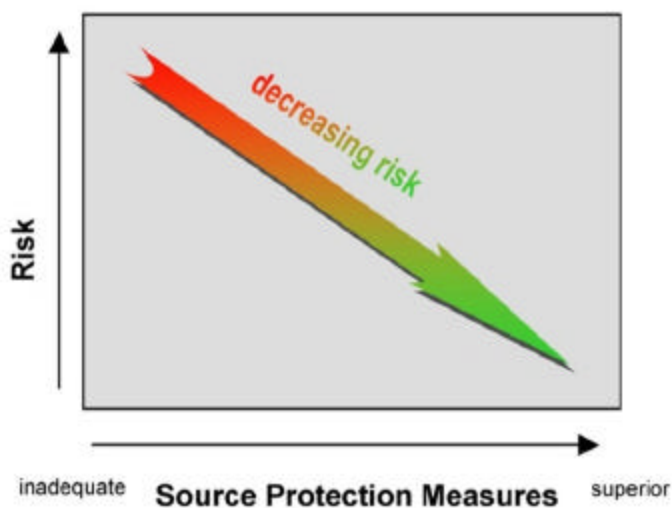


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	Moderate	42	Fertilizers: leaks, spills, improper handling, or over-application
Landscaping	3	Moderate	42 & 135	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	3	High	42 & 135	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Car/Truck/Bus Washes	1	Low	42 & 135	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Body Shops	1	High	42 & 135	Vehicle paints, solvents, and primer products: improper management
Gas Stations	1	High	42 & 135	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	1	High	42 & 135	Automotive fluids and solvents: spills, leaks, or improper handling
Cemeteries	1	Moderate	42 & 135	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	1	Moderate	42	Fertilizers or pesticides: over-application or improper handling
Medical Facility	2	Moderate	135	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Sand And Gravel Mining/Washing	2	Moderate	42 & 135	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Food Processors	1	Low	135	Cleaners, other chemicals, microbial contaminants: spills, leaks, or improper handling or storage
Industrial Lagoons and Pits	1	High	135	Abandoned
Industry/Industrial Parks	1	High	135	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	High	135	Solvents and metal tailings: spills, leaks, or improper handling

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Residential				
Fuel Oil Storage (at residences)	numerous	Moderate	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	numerous	Low	All	Microbial contaminants
Fishing/Boating	yes	Low	All	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste Generators	1	High	135	Hazardous materials and waste: spills, leaks, or improper handling or storage
Military Facilities (Past And Present)	1	High	All	Pesticides and herbicides, fuel, chemicals and other materials: spills, leaks, or improper handling or storage; may include ordnance or waste landfill/dump sites
Schools, Colleges, and Universities	1	Moderate	42	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	1	Moderate	135	Hazardous materials and waste: spills, leaks, or improper handling or storage
Transmission Line Rights-of-Way (oil and electrical)	1	Low	All	Corridor maintenance pesticides: over-application or improper handling; releases from ruptured oil lines
Transportation Corridors	2	Moderate	All	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Very Small Quantity Hazardous Waste Generator	4	Low	All	Hazardous materials and waste: spills, leaks, or improper handling or storage
Wastewater Treatment Plant/ Collection Facility/ Lagoon	1	Moderate	42	Treatment chemicals or equipment maintenance materials: improper handling or storage; wastewater: improper management

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environ-

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Oil or Hazardous Material Contamination Sites – Zone II #42 contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers (RTN) 4-0000663 (closed), 4-000660 (closed), and 4-0015035. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Gasoline/Service Stations and Auto Repair Shops – Gasoline stations typically have USTs for storage of the gasoline. Spills associated with tank fueling operations, vehicle overfills and leaking USTs are potential sources of groundwater contamination. Service stations and auto repair shops store and handle automotive fluids and they collect waste automotive fluids. Releases to the groundwater can occur if these materials are not handled or contained properly.

Gasoline/Service Stations and Auto Repair Shops Recommendation:

- ✓ Encourage these businesses to use BMP’s for the storage, handling, and disposal of all hazardous chemicals, oils and waste oils.
- ✓ If any of these facilities have floor drains, ensure that the floor drains lead to a tight tank or municipal sewer as required by the plumbing code and Underground Injection Control Regulations, 310 CMR 27.00.

7. Protection Planning – Currently, the Town has water supply protection

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Coordinate efforts with local officials to periodically compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If the controls do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs’ community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include agricultural, landscaping, car and truck washes, body shops, cemeteries, golf courses, medical

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Prevent future non-water supply activities from occurring in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	"Developing a Local Wellhead Protection Plan" is available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

facilities, sand and gravel mining, food processors, industrial, machine/metal work shops, military facilities, schools, oil and electrical transmission lines, and wastewater treatment plants. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The Town's adoption of an effective Water Resource Protection District Bylaw.
- The Town's effort to obtain funding for the development of a municipal sewer system.
- Having a formal Emergency Response Plan for dealing with spills or other emergencies.
- Regular inspections of the Zone I areas.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs>.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

htm.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 3

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
54506	Tilcon Capaldi, Inc.	Rte. 130	Sandwich	Generator of Hazardous Waste	Very Small Quantity Generator
54638	Forrestsdale School	Forestdale Ave.	Sandwich	Air Quality	Air Quality
133955	Canal Auto Body	Rte. 130	Sandwich	Generator of Hazardous Waste	Very Small Quantity Generator
264811	Cape Cod Textile	338 Rte. 130	Sandwich	Sewer Connection or Groundwater Discharge	Below Industrial Waste Water Regulated Levels
264811	Cape Cod Textile	338 Rte. 130	Sandwich	Generator of Hazardous Waste	Very Small Quantity Generator
265182	Rehabilitation Hospital of Cape & Islands	311 Service Rd.	Sandwich	Generator of Hazardous Waste	Small Quantity Generator
233072	CVS #1850	77 Quaker Meeting House Rd.	Sandwich	Generator of Hazardous Waste	Small Quantity Generator
363191	Sandwich Hollows Golf Course	Round Hill Rd.	Sandwich	Fuel Dispenser	Fuel Dispenser
363769	Sandwich Lantern Works	17 Sebastian Dr.	Sandwich	Generator of Hazardous Waste	Very Small Quantity Generator
377517	Lawrence Ready Mixed Concrete, Co.	181 Kiah's Way	Sandwich	User of Toxic Material	Large Quantity User

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Cotuit Road Mobil	273 Cotuit Road	Sandwich	reinforced fiberglass	double wall	interstitial monitoring	10,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	12,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	12,000	gasoline
Earl Oil Company	105 Route 6A	Sandwich	reinforced fiberglass	double wall	interstitial monitoring	8,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	8,000	gasoline
			steel	single wall	approved in-tank monitor	10,000	diesel
			steel	single wall		10,000	kerosene
			steel	single wall	approved in-tank monitor	10,000	fuel oil
			steel	single wall	approved in-tank monitor	10,000	fuel oil
			steel	single wall	approved in-tank monitor	10,000	fuel oil
			steel	single wall	approved in-tank monitor	10,000	fuel oil
			steel	single wall	approved in-tank monitor	10,000	fuel oil

DEP Permitted Facilities:

Sandwich Exxon	336 Route 130	Sandwich	reinforced fiberglass	double wall	interstitial monitoring	10,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	10,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	10,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	10,000	diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Notes: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000660	NORTH OF SNAKE RD	Sandwich	Oil and Hazardous Material (RTN closed)
4-0000663	GREENWAY RD JEFFERSON RD	Sandwich	(RTN closed)
4-0015035	GREENWAY RD	Sandwich	Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Southpoint Condo Trust

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Southpoint Condo Trust
<i>PWS Address</i>	100 Southpoint Drive
<i>City/Town</i>	Sandwich, MA 02563
<i>PWS ID Number</i>	4261021
<i>Local Contact</i>	D. Rich or R. Maclellan
<i>Phone Number</i>	508-477-3826

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

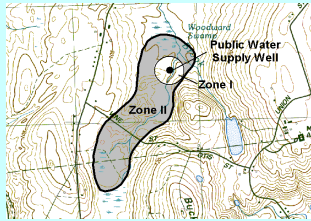
This report includes the following sections.

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: is the larger area that is likely to contribute water to the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Zone II #: *Susceptibility: Moderate*

<i>Well Name</i>	<i>Source IDs</i>
Well #1 (active)	4261021-01G
Well #2 (inactive)	4261021-02G

The Southpoint Condo Trust has one active well and an inactive well. Each well has a Zone I of 240 feet and an Interim Wellhead Protection Area (IWPA) of 592 feet. These terms are defined in the Glossary. The wells have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map for Zone I and IWPA boundaries.

For current information on treatment and the results of water quality monitoring, please contact the public water system contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses within Protection Areas

Land uses and activities that are potential sources of contamination for the wells are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Local Roads/Storm Drains

The overall ranking of susceptibility to contamination for the system is Moderate, based on the presence of at least one Moderate threat land use within the water supply protection areas, as seen in Table 2.

1. **Land Uses Within Zone I**– The Zone I for the wells is a 240 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The Southpoint Condo Trust owns or controls the Zone I, posts drinking water protection signs and conducts regular inspections. Other than the access road to the condominium complex, there are no non-water supply activities occurring within the Zone I.

Zone I Recommendations

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Keep any non-water supply activities out of the Zone I.
- ✓ Do not use fertilizers, pesticides or road salt within the Zone I.

2. **Residential Land Uses** – Approximately three condominium buildings are located within the IWPA. Common potential sources of contamination associated with residential land use include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Residential Land Use Recommendations

- ✓ Continue to educate residents on source protection measures for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and at www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Work with officials in Sandwich to improve water supply protection.
- ✓ Promote Best Management Practices (BMPs) for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.
- ✓ Encourage the Town of Sandwich to conduct household hazardous waste collection days.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

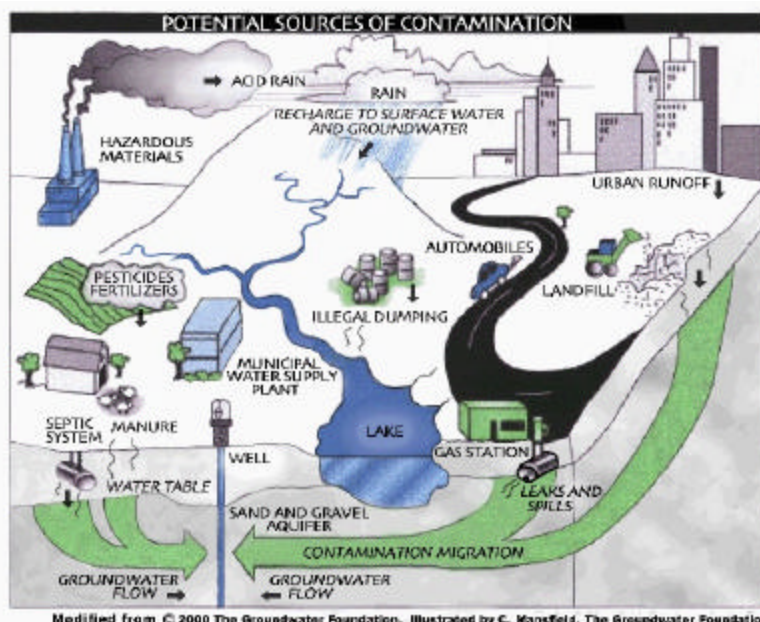
Contact your regional DEP office for more information on Source Protection and the Waiver Program.

3. **Transportation Corridor/Storm Drains -**

The access road for the condominium complex and associated driveways and parking lots are located within the IWPA. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations

- ✓ Identify stormwater drains. Wherever possible, ensure that drains discharge to outside the IWPA.
- ✓ Inspect, maintain and clean storm drains on a regular basis. Street sweeping reduces the amount of potential contaminants in runoff.



Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – The Trust owns or controls the Zone I, posts signs and conducts inspections.

Protection Planning Recommendations

- ✓ Continue to protect the Zone I and IWPA.
- ✓ Maintain contact with Sandwich public officials about local water supply protection.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection

As with many water supply protection areas, this system's IWPA contains potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas by:

- ? posting signs and conducting regular inspections of the water supply protection areas; and
- ? educating residents about their role in protecting their sources of drinking water.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

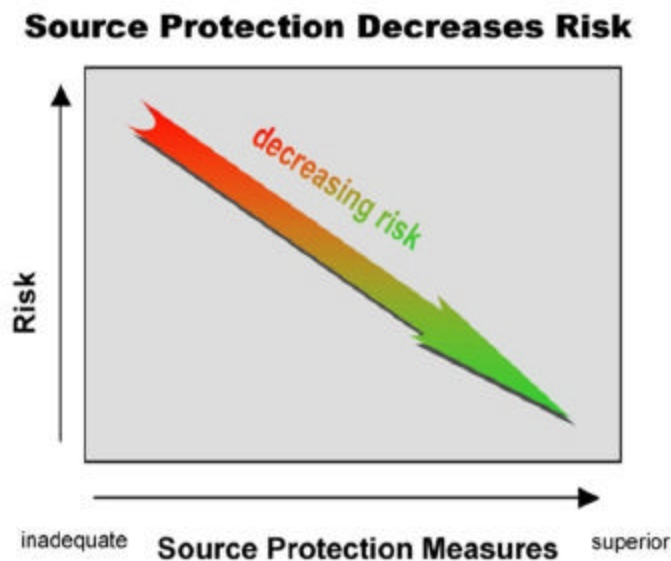


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential			
Septic Systems	few	M	microbial contaminants; improper disposal of hazardous chemicals
Fuel Oil Storage	few	M	spills, leaks or improper handling and storage of fuel oil
Lawn Care	few	M	over-application or improper storage and disposal of pesticides
Miscellaneous			
Transportation Corridors	local road	M	leaks or spills of fuel, other hazardous materials or pesticides
Storm Drains	few	L	leaks or spills; runoff containing fertilizers, pesticides, hazardous materials, pet wastes



Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES— Sandwich	
Do neighboring communities protect the Zone II areas extending into their communities?	N/A	
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow <i>Developing a Local Wellhead Protection Plan</i> available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal <i>Emergency Response Plan</i> to deal with spills or other emergencies?	NO	Work with the Town’s Local Emergency Planning Committee to conduct drills with local emergency response officials to test procedures.
Does the municipality have a wellhead protection committee?	N/A	Work with the Town of Sandwich.
Does the Board of Health conduct inspections of commercial and industrial activities?	N/A	
Does the PWS provide wellhead protection education?	YES	Continue to educate residents on how <u>they</u> can protect drinking water.

Conclusions

Source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. These recommendations are only part of your ongoing local drinking water source protection.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/nfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendix

- A. Source Protection Fact Sheets - *Water Suppliers Protect Drinking Water, Residents Protect Drinking Water*



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Seekonk Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Seekonk Water District
<i>PWS Address</i>	50 Water Lane
<i>City/Town</i>	Seekonk, Massachusetts 02771
<i>PWS ID Number</i>	4265000
<i>Local Contact</i>	Bruce Baldwin
<i>Phone Number</i>	(508) 761-8170

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 162

Susceptibility: High

Well Names	Source IDs
Brown Avenue Wellfield	4265000-01G

Zone II #: 164

Susceptibility: High

Well Names	Source IDs
Newman GP Well #1	4265000-02G
Newman GP Well #2	4265000-03G
Newman GP Well #3	4265000-04G
Newman GP Well #4	4265000-05G
McHale GP Well #5	4265000-06G

The Seekonk Water District (the Water District) provides water to over 13,000 people and 550 businesses from five wells and one wellfield that are all located in a single aquifer. Source water protection is a priority due to the fact that all of the District's water comes from one aquifer and if it were to be contaminated costly treatment might be required. The wellfield has a Zone I of 250 feet from the perimeter of the wellfield and each of the other wells has a Zone I of 400 feet. Two separate Zone IIs have been delineated as the recharge areas for the District's water supply sources. The wells and wellfield are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone IIs.

All of Seekonk's water supply has fluoride added for dental health. For the most current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for the District are a mixture of forest, residential, participation recreation land uses with small areas of cropland, commercial, and light industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning
7. Agricultural activities
8. Intermediate School Wastewater Discharge System

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. **Inappropriate Activities in Zone Is** – The Zone I for each of the five wells is a 400 foot radius around the wellhead and the Zone I for the wellfield is 250 feet around the individual well points. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. A portion of the Zone I for the Brown Avenue wellfield extends into the Ledgemont Country Club golf course. Portions of the Zone Is for Newman GP Well #1 and Newman GP Well #2 extend into East Providence Rhode Island. A small area of the Zone I for Newman GP Well #4 extends onto the Seekonk Intermediate School's playing fields. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads.

Until land is available, attempt to obtain a Memorandum of Understanding and Right of First Refusal on the Zone I lands. A Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners, into the septic system, and agree that the system will be pumped at a specific frequency. Understanding how an activity threatens drinking water quality is an important component of developing an effective MOU. A Right of First Refusal is a legal document that gives the water supplier the first chance to purchase land when it becomes available.

The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Brown Avenue Wellfield 4265000-01G – The wellfield was originally installed in 1946 and the land was conveyed to the Water District in 1947 by Ledgemont Associates. The agreement allows for Ledgemont Associates to construct and maintain a golf course on the land.

Zone I: Newman GP Wells #1 and #2 – The Zone Is for these wells extend into East Providence, Rhode Island. The Zone I area in East Providence is municipally owned (East Providence Water Department) and undeveloped.

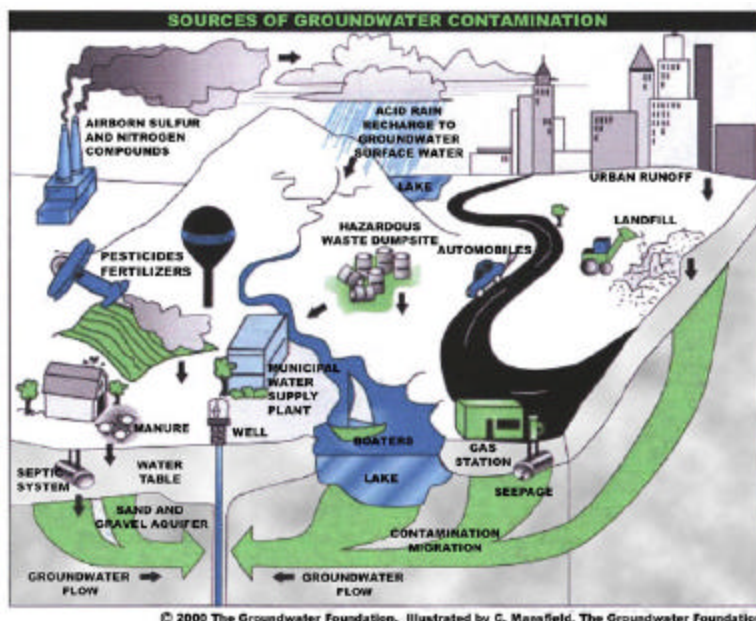
Zone I: Newman GP Well #4 – The Zone I extends into the Town of Seekonk school playing field and is managed through an easement granted by the Town to the Water District. The easement allows playing fields, bleachers, backstops, fences and the

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



use of fertilizers, herbicides and pesticides.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Work with the Town to eliminate or minimize the use of fertilizers, herbicides and pesticides within the Zone I of Newman GP Well #4.
- ✓ Work with Ledgemont Associates to eliminate or minimize the use of fertilizers, herbicides and pesticides within the Zone I of the Brown Avenue Wellfield.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 23% of the Zone IIs consist of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from

automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Route 152 and local roads run through the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

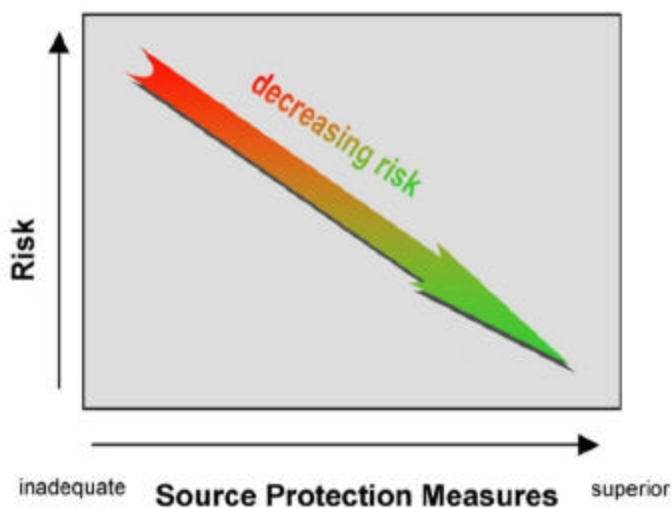


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Agriculture				
Fertilizer Storage or Use	1	M	162 & 164	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	162 & 164	Pesticides: leaks, spills, improper handling, or over-application
Livestock Operations	1	M	164	Manure (microbial contaminants) Improper handling (Very small Operation)
Landscaping	1	M	164	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	1	M	164	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Commercial				
Service Stations/ Auto Repair Shops	3	H	162 & 164	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	2	H	162	Fuels and maintenance chemicals: spills, leaks, or improper handling
Cemeteries	1	M	164	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Gas Stations	2	H	162	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	2	H	162	Automotive fluids and solvents: spills, leaks, or improper handling
Golf Courses	2	M	162	Fertilizers or pesticides: over-application or improper handling
Railroad Tracks And Yards	1	H	162	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Repair Shops (Engine, Appliances, Etc.)	1	H	162 & 164	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
* Notes for Table 2 can be found on page 11 of this document				

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Industrial				
Foundries Or Metal Fabricators	1	H	162	Solvents and other chemicals: spills, leaks, or improper handling or storage (Metal Fabricator)
Residential				
Fuel Oil Storage (at residences)	Numerous	M	162 & 164	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	Numerous	M	162 & 164	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	162 & 164	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aboveground Storage Tanks	3	M	162	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Numerous	L	162 & 164	Microbial contaminants
Clandestine Dumping	Few	H	162 & 164	Debris containing hazardous materials or wastes
Landfills and Dumps	1	H	164	Seepage of leachate (Closed, but, uncapped)
Pipeline (Oil or Sewer)	1	M	162	Oil or sewage: spills or leaks (Oil)
Schools, Colleges, and Universities	1	M	164	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	162 & 164	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way -	1	L	162 & 164	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	Several	M	162 & 164	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling. (Rt. 152 and local roads)
Underground Storage Tanks	Numerous	H	162	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	1	L	162	Chemicals and other materials including PCBs: spills, leaks, or improper handling
Small quantity hazardous waste generators	1	M	162	Hazardous materials and waste: spills, leaks, or improper handling or storage
* Notes for Table 2 can be found on page 11 of this document				

(Continued from page 4)

potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbas ins.

Railroad tracks run directly through the Zone II for McHales Pond GP Well #5. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone Is.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Commercial and industrial land uses make up a small portion of the land area within the Zone IIs for Seekonk. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40000626. Refer to the attached map and Appendix B for more information.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the Zone Is?	NO	Pursue Zone I ownership. If ownership is not feasible seek conservation restrictions, Memorandum of Understandings restricting uses.
Are the Zone Is posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are Zone Is regularly inspected?	YES	Continue regular inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Update Seekonk’s bylaws and health regulations to meet DEP’s requirements. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement the Plan.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Continue to update plan annually. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from the Water District, Town officials, citizens’ groups, neighboring communities, and the business community.
Does the Board of Health conduct regular inspections of commercial and industrial activities?	NO	For more guidance see “Hazardous Materials Management: A Community's Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone IIs.

(Continued from page 7)

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a well. Currently, the Town of Seekonk has local controls to protect the water supply. However, the boundaries of Seekonk's Groundwater Aquifer Protection District are not consistent with DEP's delineated Zone II boundaries and the regulations governing restricted land uses in Seekonk do not meet DEP's restrictions specified in DEP's regulations 310 CMR 22.21(2). A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. The District has a Wellhead Protection Plan.

Protection Planning Recommendations:

- ✓ Establish a Wellhead Protection Committee to implement "The Seekonk Water District Wellhead Protection Plan". June 2002. Tellus Institute.
- ✓ Coordinate efforts with local officials to update local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Be sure to include local floordrain controls that meet 310 CMR 22.21(2).

7. Agricultural Activities – There is one farm, one nursery/landscaping operation, and one smaller greenhouse/flower and plant shop within Seekonk's protection areas. Pesticides, herbicides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with the farm in your protection area to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with users of fertilizers, herbicides and pesticides to ensure proper use and storage.

8. Intermediate School Wastewater Discharge System – Seekonk's Intermediate School utilizes a Smith & Loveless FAST treatment system to treat its wastewater. DEP approved the use of this type of subsurface wastewater disposal system and set effluent limits not to be exceeded. Due to insufficient inputs of waste to the system nitrate levels exceeded the set limits on several occasions. The School modified the system by including methanol injection to provide more "food" to the system. Both methanol and nitrate are concerns for drinking water supplies. No adverse effects on the Water District's wells has been detected from either nitrate and methanol, however, the situation should be continually monitored.

Intermediate School Wastewater Recommendations:

- ✓ Work with School to explore alternatives to methanol as a "food" for the system.
- ✓ Work with School to optimize system operation and update a detailed plan for operation, monitoring and maintenance of the system.
- ✓ Ensure current procedures for delivery, storage and use of methanol adequately protect the water supply.

Other land uses and activities within the Zone IIs that are of concern include an

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

uncapped landfill, auto repair shops, gas stations, a metal fabricator and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the Water District's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier and the Town of Seekonk are commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Developing a Wellhead Protection Plan in conjunction with the Tellus Institute, funded by a DEP Source Protection Grant Program
- Actively pursuing land purchases or controls within the Zone I areas by the Water District and the Town.
- Developing an "Emergency Response Plan" and updating it annually.
- The Department of Public Works' (DPW) active street sweeping and catch basin cleaning program.
- The DPW program to accept (free of charge) automotive wastes, paints and solvents year round and annual household hazardous waste collection.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Form a Wellhead Protection Committee to implement Wellhead Protection Plan recommendations.
- ✓ Partner with local businesses to promote Best Management Practices.
- ✓ Address commercial and residential fertilizer, herbicide and pesticide use within Zone Is and Zone IIs.
- ✓ Make "Best Effort" to protect all of Zone II areas by encouraging the Town to update Seekonk's bylaws to meet DEP's current 310 CMR 22.21(2) regulations and develop and implement a Board of Health Floor Drain Regulation.
- ✓ Develop and implement a Hazardous Materials Controls Program.
- ✓ Provide public education on source protection.
- ✓ Consider Land Acquisition Program and Growth Controls.
- ✓ Review Seekonk Intermediate School Wastewater Discharge Treatment System.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional detailed source protection recommendations can be found in Seekonk Water District's Wellhead Protection Plan, Table 3 and the Key Issues. To review a copy of Seekonk's Wellhead Plan a requests needs to be directed to the public water supply contact listed in Table 1 of this report.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Notes For Table 2 (Pages 5&6):

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA
DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
54640	M AITKENS SCHOOL	NEWMAN AVE	SEEKONK	Plant	Air Quality Permit
126957	MUTUAL OIL	1075 NEWMAN AVE	SEEKONK	Fuel Dispenser	Fuel Dispenser
132134	G M IND INC	257 PINE ST	SEEKONK	Generator of Hazardous Waste	Very Small Quantity Generator of Hazardous Waste
137282	DB MART #13	1035 NEWMAN AVE	SEEKONK	Fuel Dispenser	Fuel Dispenser
281561	MODERN TRACTOR & TRUCK SERVICE INC	400 PINE ST	SEEKONK	Generator of Hazardous Waste	Very Small Quantity Generator of Waste Oil or PCBs
297553	DAIRY MART #831	1502 NEWMAN AVE	SEEKONK	Fuel Dispenser	Fuel Dispenser
315811	CVS #0394	1475 NEWMAN AVE	SEEKONK	Generator of Hazardous Waste	Small Quantity Generator

APPENDIX A Continued: Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
DB MARKETING #831 ID #3712	1502 NEWMAN AVE	SEEKONK	Cathodic	1 Wall	I	10000	Gasoline
			Cathodic	1 Wall	I	4000	Gasoline
			Cathodic	1 Wall	I	8000	Gasoline
LEDGEMONT COUNTRY CLUB ID #3718	131 BROWN AVE	SEEKONK	Steel	1 Wall	I	650	Diesel
MUTUAL OIL CO INC ID #3733	1075 NEWMAN AVE	SEEKONK	Reinforced	2 Walls	I	10000	
			Reinforced	2 Walls	I	10000	
MUTUAL OIL CO INC ID #3733	1075 NEWMAN AVE	SEEKONK	Reinforced	2 Walls	I	10000	
			Reinforced	2 Walls		275	Waste Oil
NEWMAN AVE TEXACO ID #3726	1035 NEWMAN AVE	SEEKONK	Reinforced	1 Wall	A	4000	Gasoline
			Reinforced	1 Wall	A	6000	Gasoline
			Reinforced	1 Wall	A	6000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000626	1502 NEWMAN AVENUE	SEEKONK	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Sharon Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Sharon Water Department
<i>PWS Address</i>	217R South Main Street
<i>City/Town</i>	Sharon, MA 02067
<i>PWS ID Number</i>	4266000
<i>Local Contact</i>	David Masciarelli
<i>Phone Number</i>	(781) 784-1525

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

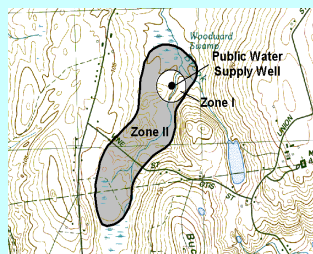
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 80

Susceptibility: High

Well Names	Source IDs
GP Well # 5	4266000-04G

Zone II #: 289

Susceptibility: High

Well Names	Source IDs
GP Well # 2	4266000-01G
GP Well # 3	4266000-02G
GP Well # 4	4266000-03G

Zone II #: 328

Susceptibility: High

Well Names	Source IDs
Well # 6	4266000-05G

Zone II #: 329

Susceptibility: High

Well Names	Source IDs
Well # 7	4266000-06G

The wells for the Sharon Water Department are located in four Zone II. Each well has a Zone I of 400 feet. The Zone II are largely in the southwestern part of the town, with Zone II #328 for Well #7 and Zone II #80 for Well #5 extending in to the Town of Foxborough. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Well #7 (06G) is under investigation as to whether it is groundwater under the direct influence of surface water (GWUDI). If the well is determined to be a GWUDI source, the water supplier should inventory land uses and investigate source protection options within the Zone III. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

All of the active wells have potassium hydroxide added for corrosion control, sodium hypochlorite added as a disinfectant, and are fluoridated for dental health. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for Sharon are a mixture of forested and residential land uses with a small area of commercial land uses (refer to attached map for details). Land

uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone Is for all of the wells are owned or controlled by the public water system with the exception of the Zone I for the GP Well #4 (03G). Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: GP Well #4 (03G) - Contains roads, homes with septic systems, railroad tracks, and vehicle parking.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Investigate options for removal of any nonconforming septic systems within the Zone I for GP Well #4, including purchase of residential

property as it becomes available.

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Portions of all of the Zone II consist of residential areas. Only a small percentage of those areas have public sewers, so the remainder use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

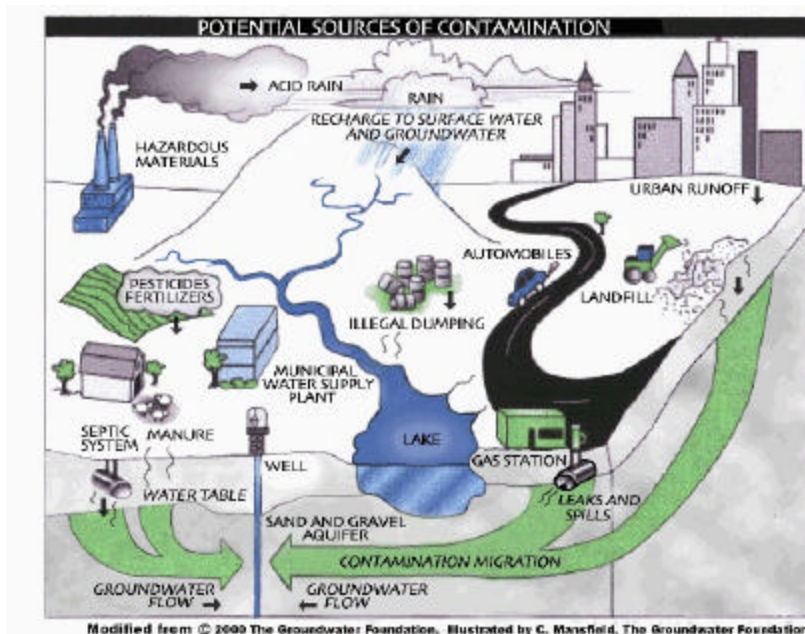
- **Septic Systems** – Improper disposal of

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Interstate 95 runs through Zone II #80 just south of the wells. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater

and wash in to catchbasins.

Railroad tracks run through the water supply protection areas. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 849-4030 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

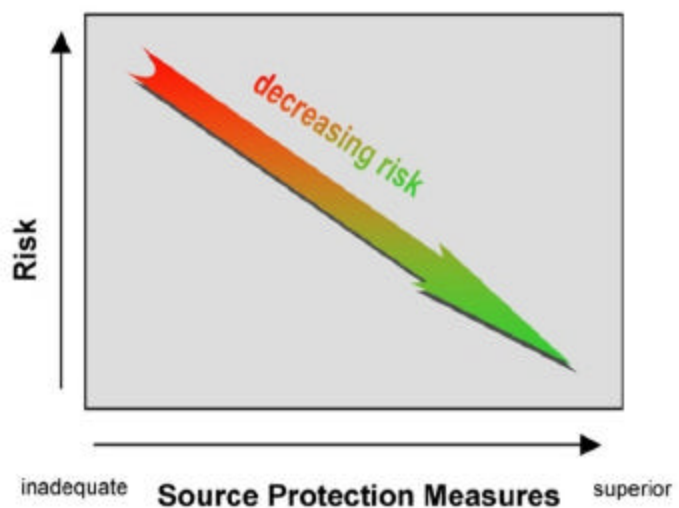


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Agriculture				
Fertilizer Storage or Use	2	M	#80, #329	Fertilizers: leaks, spills, improper handling, or over-application
Landscaping	1	M	#80	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Nurseries	1	M	#80	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	1	H	#80	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Car/Truck/Bus Washes	1	L	#289	Vehicle wash water, soaps, oils, greases, metals, and salts: improper management
Gas Stations	2	H	#80, #289	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Dry Cleaners	1	H	#80	Solvents and wastes: spills, leaks, or improper handling
Medical Facilities	1	M	#80	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Photo Processors	1	H	#80	Photographic chemicals: spills, leaks, or improper handling or storage
Railroad Tracks And Yards	1	H	#289, #329	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals:
Residential				
Fuel Oil Storage (at residences)	100 +	M	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	100 +	M	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	100 +	M	All	Hazardous chemicals: microbial contaminants, and improper disposal

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Miscellaneous				
Composting Facilities	1	L	#289	Organic material, animal waste, and runoff: storage and improper handling
Fishing/Boating	Some	L	#80	Fuel and other chemical spills, microbial contaminants
Oil or Hazardous Material Sites	1	--	#80	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road And Maintenance Depots	1	M	#289	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	1	M	#80	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Small quantity hazardous waste generators	1	M	#80	Hazardous materials and waste: spills, leaks, or improper handling or storage
Stormwater Drains/ Retention Basins	Numerous	L	All	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	L	#80, #329	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	1	M	#80	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	2	H	#80, #289	Stored materials: spills, leaks, or improper handling
Very Small Quantity Hazardous Waste Generator	2	L	#80	Hazardous materials and waste: spills, leaks, or improper handling or storage

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – A small portion of the land area within the Zone II #80 is commercial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-0014036 and 4-0000202. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



6. Agricultural Activities – There are several farms within the protection areas, concentrated in Zone II #80. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

7. Protection Planning – Currently, the Town does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES, other than 03G	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES, other than 03G	Continue monitoring non-water supply activities in Zone I for GP Well #4 (03G).
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Water Protection District" meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Work with Foxborough to raise awareness of Zone II areas.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a formal wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, residential, and municipal uses within the Zone II.

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If they do not meet the most current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include car washes, gas stations, dry cleaners, and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Protecting Zone II areas with bylaws that meet DEP's regulations.
- Protecting Zone II areas for other water suppliers when those areas extend in to the Town of Sharon.
- Removing underground storage tanks as the opportunity arises.
- Purchasing Zone I land when feasible.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
135758	CUMBERLAND FARMS #2453	433 S. MAIN ST	SHARON	FUEL DISPENSER	FUEL DISPENSER
293861	CORMANS CLEANERS	380 MAIN ST	SHARON	GENERATOR OF HAZARDOUS WASTE	VERY SMALL QUANTITY GENERATOR
348495	SHARON DPW	217R S. MAIN ST	SHARON	FUEL DISPENSER	FUEL DISPENSER
367926	BROOKS PHARMACY	800 S. MAIN ST	SHARON	GENERATOR OF HAZARDOUS WASTE	VERY SMALL QUANTITY GENERATOR

Underground Storage Tanks

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Town of Sharon DPW	217R S. Main St	Sharon	Municipal	2 Wall	Interstitial Space Monitor	10000	Gasoline
				2 Wall	Interstitial Space Monitor	10000	Diesel
Cumberland Farms	433 S. Main St	Sharon	Gas Station	2 Wall	Interstitial Space Monitor	8000	Gasoline
				2 Wall	Interstitial Space Monitor	8000	Gasoline
				2 Walls	Interstitial Space Monitor	8000	Gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0014036	Route 95 North	Foxborough	Oil or Hazardous Material
4-0000202	170-186 Oak Street	Foxborough	Oil and Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Stoughton Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Stoughton Water Division
<i>PWS Address</i>	950 Central Street
<i>City/Town</i>	Stoughton
<i>PWS ID Number</i>	4285000
<i>Local Contact</i>	Lawrence Barrett
<i>Phone Number</i>	(781) 344-2112

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

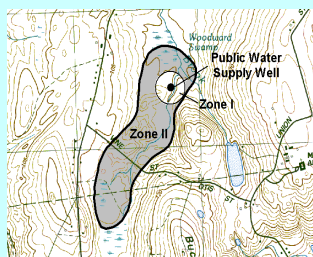
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #85

Susceptibility: Moderate

Well Name	Source ID
Goddard Well	4285000-07G

Zone II #138

Susceptibility: Moderate

Well Name	Source ID
Fennel GP Well	4285000-02G
Mc Namara GP Well	4285000-03G
Gurney GP Well	4285000-04G

Zone II #139

Susceptibility: Moderate

Well Name	Source ID
Muddy Pond Well	4285000-05G

Zone II #140

Susceptibility: High

Well Name	Source ID
Pratt Court Well	4285000-06G

Zone II #378

Susceptibility: High

Well Name	Source ID
Harris Pond GP Well	4285000-08G

Purchased Sources

Supplier Name	Purchase ID
Canton Water Department	4285000-01P
Easton Water Division	4285000-02P
Sharon Water Department	4285000-03P

Six of the seven wells for Stoughton Water Division are located along the western town boundary. The other well is located west of Sumner Street and Goddard Memorial Hospital. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone IIs.

Stoughton Water Division also purchases some of its water from the purchased sources listed in the table above. Please see the appendices for copies of the SWAP reports for each of these purchased source providers.

All wells with the exception of Pratt Court Well have hydrated lime added for corrosion control. Potassium hydroxide and potassium permanganate are added to Pratt Court Well for pH adjustment and iron and manganese removal. Gaseous chlorine is added to four of the seven wells for disinfection, Muddy Pond Well-05G, Pratt Court Well-06G, Goddard Well-07G and Harris Pond GP Well-08G. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The land uses within the Zone IIs for Stoughton are predominantly residential (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Landfills and dumps
4. Medical Facilities
5. Oil or hazardous material contamination sites
6. Schools
7. Underground Storage Tanks
8. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

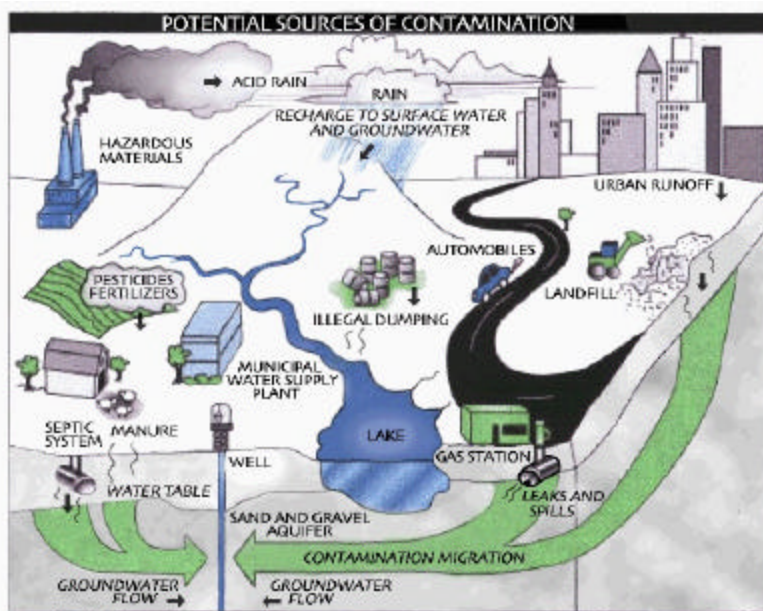
- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

1. Inappropriate Activities in Zone Is –

The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The seven (7) Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: General – Dirt bikes have been observed driving through Zone I areas.



Zone I: Goddard Well 4285000-07G – Portions of private yards and the playground for a former day care center fall within the Zone I. The water supplier controls but does not own the Zone I portions of these properties. Electric transmission lines run through the west side of the Zone I

Zone I Recommendations:

- ✓ Fence off Zone I areas that are Town owned to prevent unauthorized entry.
- ✓ Contact your local utility company to ensure that pesticides and herbicides are not sprayed in the Zone I or Zone II for Goddard Well.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 50% of the Zone IIs consist of residential areas. Although some of the Zone II areas are serviced by public sewer it is possible that some residences use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and

adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

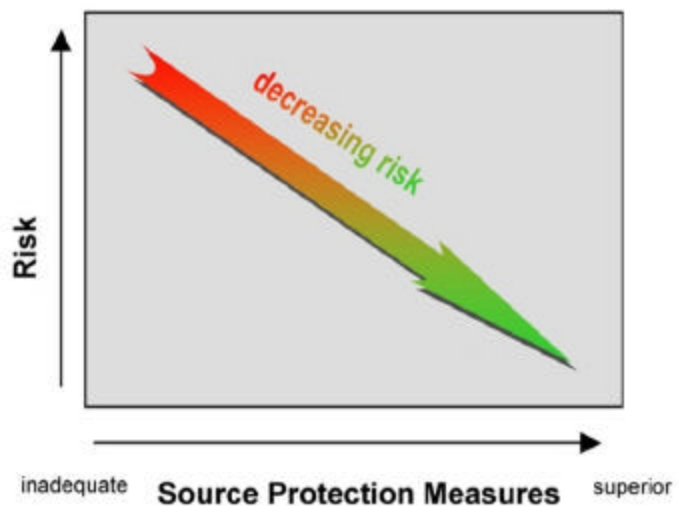


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Agricultural				
Dairy Farms	1	Moderate	378	Manure (microbial contaminants): improper handling
Commercial				
Cemeteries	1	Moderate	138	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Medical Facility	1	Moderate	85	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	numerous	Moderate	All	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	Moderate	All	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	Moderate	All	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	some	Low	138, 139, 140, & 378	Microbial contaminants
Fishing/Boating	some	Low	138, 139, 140 & 378	Fuel and other chemical spills, microbial contaminants
Clandestine (Illegal) Dumping	some	Moderate	All	Material containing hazardous materials or wastes
Schools, Colleges, and Universities	1	Moderate	140 & 378	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Landfills and Dumps	1	Moderate	140 & 378	Corridor maintenance pesticides: over-application or improper handling; construction (Gas line and electrical line easements)
Underground Storage Tanks	1	High	140 & 378	Stored materials: spills, leaks, or improper handling

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II Number	Potential Source of Contamination
Miscellaneous Continued				
Transmission Line Right-of-Way (electrical)	1	Low	85	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	1	Moderate	378	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Stormwater Drains/ Retention Basins	1	Low	378	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Small Quantity Hazardous Waste Generators	1	Moderate	140 & 378	Hazardous materials and waste: spills, leaks, or improper handling or storage

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

(Continued from page 4)

<http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Landfills and Dumps – An old dump that was closed in the 1950s exists within the Pratt Court Well and Harris Pond GP Well Zone IIs. Since the dump was closed in the 1950s it pre-dates current landfill closure regulations. The threats associated with landfills/dumps are associated with the downgradient migration of landfill leachate that potentially may contain hazardous waste, solvents or other contaminants such as metals, nitrates, nitrites, etc.

Landfills and Dumps Recommendations:

- ✓ The water supplier or Town should consider the installation of monitoring wells on the downgradient edge of the closed dump to determine whether there are any contaminants of concern.

4. Medical Facilities – A medical facility is located in the Zone II for Goddard Well. Medical facilities generate biological waste; use chemicals and generate chemical waste; and, may use radioactive material and generate low-level radioactive waste. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Work with medical facility to make certain that BMPs are in place for the storage, handling, and disposal of biological, chemical, and radioactive waste.
- ✓ Educate facility on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Oil or Hazardous Material Contamination Sites – The Zone II for Goddard Well contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 4-0006075. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.

6. Schools – A School is located in the northeast portion of the Zone IIs for Pratt Court Well and Harris Pond GP Well. Activities associated with schools commonly involve hazardous materials such as fuel oil, laboratory, art, photographic, machine shop, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed into septic systems.

Schools Recommendation:

- ✓ Contact schools in the Zone II to discuss source protection issues including BMPs that they can reduce the risk of contamination.
- ✓ Assist schools with source protection education for maintenance staff, food preparation staff, teachers and students.

7. Underground Storage Tanks – A Town owned UST with diesel fuel for a backup generator for Pratt Court Well is located within the Zone IIs for Pratt Court Well and Harris Pond GP Well. The original UST was removed from the Zone I and replaced outside of the Zone I with a double walled reinforced fiberglass UST with interstitial monitoring. The current UST has also been placed in a concrete vault as an additional leak prevention measure. If managed improperly, underground storage tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Consider replacing the diesel powered generator with a liquid propane or natural gas powered generator. Grant money may be available for the UST removal through Massachusetts Department of Revenue. Grant and loan money may be available for the conversion/replacement of the diesel powered generator to one that uses liquid propane or natural gas through the Bureau of Resource Protection. See the conclusions in Section 3 below for more information regarding grant/loan programs.

8. Protection Planning – Currently, Stoughton Water Division is in compliance

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



with controls that are required in DEP's Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. Stoughton also has a Wellhead Protection Plan. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Stoughton Water Division and the Town should work with officials in The Town of Sharon to adopt controls that meet 310 CMR 22.21(2) for those portions of the Zone IIs that extend into Sharon. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, work to establish floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

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Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	A portion of the Zone I for source 07G is the yard of an existing home, but water supplier has control over this area.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	

(Continued from page 7)

Other land uses and activities within the Zone II include a dairy farm, cemetery, aquatic life, fishing/boating, clandestine dumping, transportation corridor, stormwater drains/retention basins, electric transmission lines, and small quantity hazardous waste generator. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier and Town are commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The implementation of wellhead protection bylaws that meet DEP standards.
- The establishment of a Town Environmental Officer who monitors buildings in the Zone II to ensure that new facilities meet the by-law standards and who inspects new septic systems in the Zone II for Harris Pond Well to ensure that nitrate removal systems conform to the requirement.
- Twice daily inspections of the Zone Is.
- Having a Wellhead Protection Plan.
- Having a formal Emergency Response Plan to deal with spills or emergencies.
- Providing wellhead protection education.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ When feasible, remove any non-water supply activities from the Zone I.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm> . Grants are also available from the Massachusetts Department of Revenue's (DOR's) Underground Storage Tank (UST) Program for the removal of underground storage tanks. For more information regarding the DOR UST program visit their website at: http://www.dor.state.ma.us/ust/ust_home.htm.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection
- D. SWAP Report for Canton Water Department
- E. SWAP Report for Easton Water Division
- F. SWAP Report for Sharon Water Department
- G. SWAP Report for Randolph Water Department

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 2

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
26307	Quality Steel Products, Inc., Qual Craft	1551 Central Street	Stoughton	Generator of Hazardous Waste	Small Quantity Generator

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Stoughton Water Division*		Stoughton	reinforced fiberglass	double walled	interstitial monitoring	8,000	Diesel

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Notes: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* The tank listed is not included in the Office of the State Fire Marshall's database probably because it does not meet the reporting requirements.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0006075	909 Sumner Street	Stoughton	Oil and/or Hazardous Material

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Copperwood II Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
October 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Copperwood II Condominiums
PWS Address	62 Copperwood Drive
City/Town	Stoughton, MA 02072
PWS ID Number	4285003
Local Contact	Wayne Southworth
Phone Number	508-238-4230

Well Name	Source ID#	Zone I (in feet)	IWPA	Source Susceptibility
Well #1	01G	140	½ mile	HIGH
Well #2	02G	140	½ mile	HIGH
Well #3	03G	140	½ mile	HIGH
Well #4	04G	140	½ mile	HIGH
Well #5	05G	140	½ mile	HIGH

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

1. Description of the Water System

Wells #1 through #5 provide drinking water to the residents of the Copperwood II condominium community in Stoughton. The wells have Zone Is of 140 feet and an Interim Wellhead Protection Area (IWPA) of one-half mile. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (residences, parking, roadways)
2. Transportation Corridors
3. Industrial Land Uses
4. Landfill
5. Gas Stations/Body Shops/Automobile Repair
6. Car Wash
7. Railroad Tracks
8. Transmission Line
9. Regulated Facilities – Very Small Quantity Generators of Hazardous Waste
10. DEP Tier Classified Hazardous Material or Oil Release Sites

Table 2: Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Residential, Parking, Roadways	Yes	Yes	M	pesticides and fertilizers from lawn care; leaks or spills of automotive fluids; stormwater
Transportation Corridors (local roads)	Yes	Yes	M	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way; stormwater contaminants
Industrial Land Uses	No	Yes	H	leaks or spills of chemicals; stormwater
Landfill	No	Yes	H	movement of leachate
Gas Stations/Body Shop/Automotive Repair	No	Yes	H	leaks or spills of automotive solvents
Car Wash	No	Yes	L	vehicle washwater; illegal dumping
Railroad Tracks	No	Yes	H	over-application of herbicides; accidents
Transmission Line	No	Yes	L	spills or over-application of herbicides
Regulated Facilities	No	Yes	L	spills, leaks of hazardous wastes
DEP Tier Classified Release Sites	No	Yes	not ranked	spills, leaks of hazardous materials & wastes

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The overall ranking of susceptibility to contamination for the wells is HIGH based on the presence of at least one HIGH threat within the Zone I and IWPA.

1. **Zone I**– The public water system conducts regular inspections but does not own or control the entire Zone I. About 50 homes, on sewer, and associated roadways are located within the Zone I. Additional homes and roadways are located within the Zone II. The public water system does not meet DEP's Zone I requirements because of non-water supply activities within the Zone I.

Forty-two percent of the Zone I and IWPA consists of residences. The homes are on sewer and use gas for heating. Spills or over-application of pesticides and fertilizers used for lawn care are a potential concern.

Recommendations

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ If a lawn care company services the complex, inform them of protection measures to take to protect the wells. Do not use pesticides or fertilizers within the Zone I.
- ✓ Do not use or store de-icing materials within the Zone I.

2. **Transportation Corridors** – Local roads are located within the IWPA. Leaks and spills, vehicular accidents, and over-application or spills of pesticides are potential sources of contamination.

In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

Recommendations

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.
- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

3. **Industrial Land Uses** – Industrial land uses comprise 19% of the IWPA.

Recommendations

- ✓ Encourage the town to do inspections of industrial facilities to encourage BMPs.

4. **Landfill** – Canton's landfill is within the IWPA.

Recommendation

- ✓ Be aware of the location of the landfill.

5. **Gas Stations/Body Shops/Auto Repair** – There are numerous facilities within the IWPA.

Recommendation

- ✓ Encourage the town to do inspections of these facilities.

6. **Car Wash** – There is a car wash within the IWPA.

Recommendation

- ✓ Encourage the town to inspect the facility.

7. **Railroad Tracks** – A railroad track runs along the edge of the IWPA.

Recommendation

- ✓ The railroad's Vegetation Management Plan and Yearly Operating Plan are on file in the local Conservation Commission office. These documents, which can be viewed by the public, describe herbicide use along the railroad right-of-way.

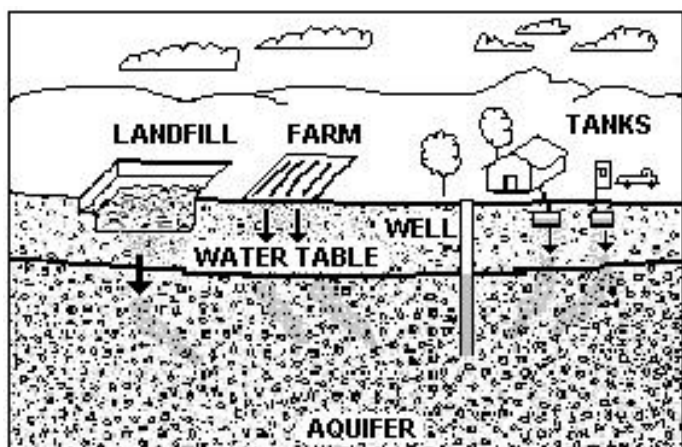


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

8. Transmission Line – There is a transmission line running through the IWPA.

Recommendation

- ✓ The utility's Vegetation Management Plan and Yearly Operating Plan are on file in the local Conservation Commission office. These documents, which are available for view by the public, describe herbicide use along the right-of-way.

9. Regulated Facilities – There are some DEP regulated facilities, such as Very Small Quantity Generators of Hazardous Waste, in the IWPA.

Recommendation

- ✓ Be aware of the locations of these facilities.

10. DEP Tier Classified Oil or Hazardous Material Release Sites – There are some contamination sites within the IWPA.

Recommendation

- ✓ The status of clean-ups at these sites can be tracked at www.state.ma.us/dep/bwsc/sitelist.htm.

3. Recommendations for Protection

Implementing protection measures will reduce susceptibility to contamination.

Priority Recommendations:

Zone I

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Continue to inspect the Zone I.

Training and Education

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Planning

- ✓ Work with town officials to improve water supply protection.

Funding

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- Residents Protect Drinking Water fact sheet



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Swansea Water District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Swansea Water District
<i>PWS Address</i>	700 Wilbur Avenue
<i>City/Town</i>	Swansea, Massachusetts 02777
<i>PWS ID Number</i>	4292000
<i>Local Contact</i>	Robert Marquis
<i>Phone Number</i>	(508) 676-7452

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

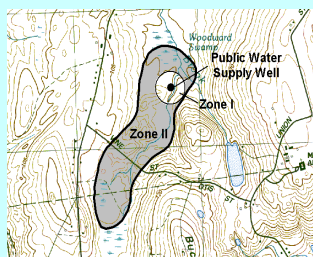
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 116

Susceptibility: Moderate

Well Names	Source IDs
Midwood Drive Well #1	4292000-01G
Midwood Drive Well #2 (Inactive)	4292000-02G
Midwood Drive Well #3 (Inactive)	4292000-03G

Zone II #: 450

Susceptibility: High

Well Names	Source IDs
Maker Well #4	4292000-04G
Maker Well #5	4292000-05G
Vinnicum Road Well #6	4292000-06G
Borge Well #7	4292000-07G
Vinnicum Road Well #9	4292000-09G
Vinnicum Road Well #10	4292000-10G
Borge Well #11	4292000-11G

Zone II #: 252

Susceptibility: Moderate

Well Names	Source IDs
Hornbine Wellfield #8	4292000-08G

The Swansea Water District (the District) receives its water from nine active groundwater wells located in three Zone II protection areas. The District has two inactive wells that will be assessed as part of this report and a proposed well that will not be assessed in this report. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All of the District's water is treated with sodium hydroxide and sodium carbonate for corrosion control and fluoride for dental health. When required, chlorine is added for control of bacterial growth. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for the District are dominated by forest and residential land uses with small areas of commercial, and light industrial land uses in Zone II #450 (refer to above table and attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail

provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The eleven Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Midwood Drive Well #1 4292000-01G – Two private residences are located on the southern edge of the Zone I.

Zone I: Vinnicum Road Well #6 4292000-06G – Diesel fuel storage for back-up power (1000 gallon tank with secondary containment).

Zone Is: Maker Road Well #4 (04G), Maker Road Well#5 (05G), Borge Well #7 (07G) and Hornbine Wellfield #8 (08G) – There is unauthorized off-road vehicle access in the Zone Is for these wells.

Zone I Recommendations:

- ✓ Convert back-up power at Well #6 to propane.

- ✓ Restrict off-road vehicles from Zone I areas.
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

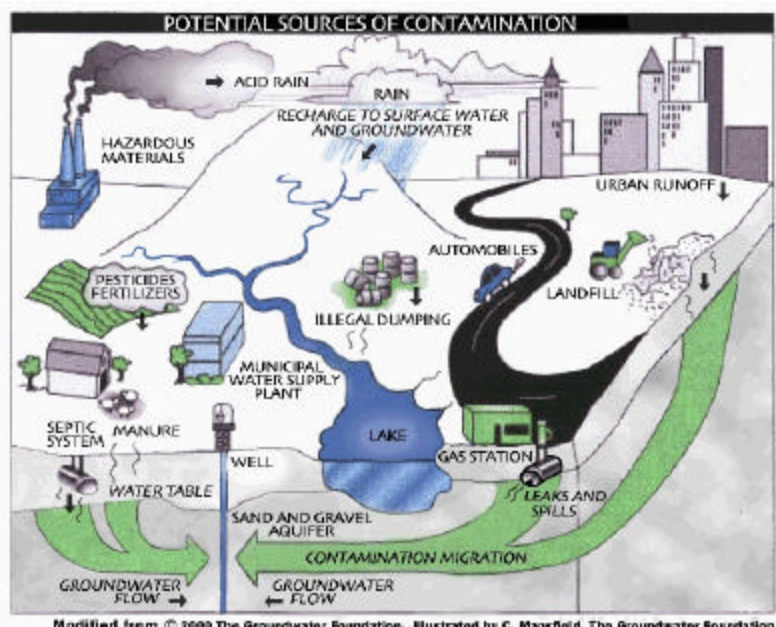
2. Residential Land Uses – Residential areas are common throughout the Zone IIs. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with

**Benefits
of Source Protection**

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 195 and Route 6 run through the Zone II

#450. Local roads are common throughout all the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren’t yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

(Continued on page 7)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

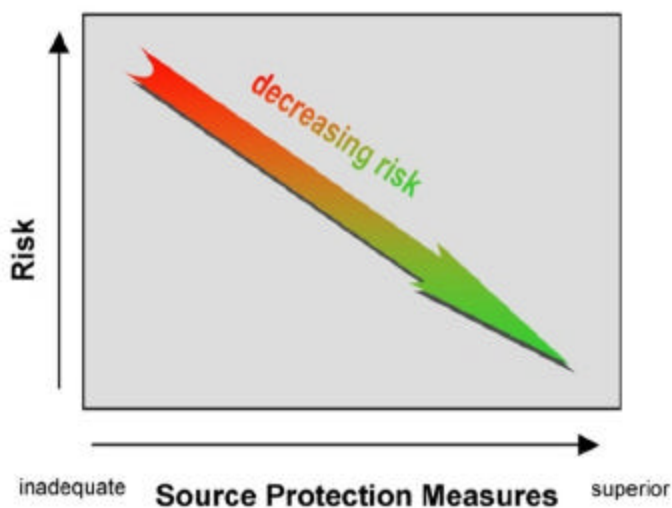


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Agricultural				
Fertilizer Storage or Use	1	M	116	Fertilizers: leaks, spills, improper handling, or over-application
Commercial				
Cemeteries	1	M	116	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Golf Courses	1	M	450	Fertilizers or pesticides: over-application or improper handling
Junk Yards and Salvage Yards	1	H	450	Automotive chemicals, wastes, and batteries: spills, leaks, or improper handling
Nursing Homes	1	L	450	Microbial contaminants: improper management
Sand And Gravel Mining/Washing	1	M	450	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Industrial				
Machine/Metalworking	1	H	450	Solvents and metal tailings: spills, leaks, or improper handling
Residential				
Fuel Oil Storage (at residences)	numerous	M	all	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	numerous	M	all	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	numerous	M	all	Hazardous chemicals: microbial contaminants, and improper disposal

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II	Potential Source of Contamination
Miscellaneous				
Aboveground Storage Tanks	1	M	450	Materials stored in tanks: spills, leaks, or improper handling
Aquatic Wildlife	Some	L	all	Microbial contaminants
Fire Training Facilities	1	M	450	Fuels and other chemicals: improper use or storage
Landfills and Dumps	1	H	450	Seepage of leachate
Oil or Hazardous Material Sites	1	--	450	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are
Pipeline (Oil)	1	M	116 & 252	Oil or sewage: spills or leaks
Schools, Colleges, and Universities	1	M	450	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Stormwater Drains/Retention Basins	numerous	L	all	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way -	1	L	all	Corridor maintenance pesticides: over-application or improper handling; construction
Transportation Corridors	2	M	450	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Water Treatment Sludge Lagoon	1	M	all	Sludge and wastewater: improper management

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Hazardous Materials Storage and Use – Small areas of Zone II #450 are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – Zone II #450 contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40013319. Refer to the attached map and Appendix B for more information.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.



6. Protection Planning – Currently, the Town has water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Continue with “Best Effort” attempts with Rehoboth and Dighton to include the District’s Zone IIs in their protection bylaws.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I areas?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Are the Zone Is posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are Zone Is regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring non-water supply activities in Zone Is and remove when feasible.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Continue to work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Use Wellhead Protection Committee to implement goals of Plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Ensure committee includes representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone IIs include auto salvage yards, landfills, machine shops and schools. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The acquisition and protection of the Zone Is for Swansea Water District.
- Using DEP grant money to develop a land management plan, perform a detailed inventory of the District's protection areas and follow-up recommendations to address the potential sources of contamination.
- Meeting of DEP's Wellhead Protection Controls in 310 CMR 22.21(2) by the town of Swansea.
- Making "Best Effort" attempts to work with the towns of Rehoboth and Dighton to improve their source protection controls.
- Coordinating inspection and enforcement efforts with the local Board of Health.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Continue your active responses to the recommendations outlined in the September 2002 "Swansea Source Water Protection Project"
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

oil or contamination sites.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone IIs. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA**DEP Permitted Facilities**

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
No DEP permitted facilities were identified during the inventory.					

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No Department of Fire Services registered Underground Storage Tanks were identified during the inventory.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0013319	PLAIN ST	REHOBOTH	Hazardous Materials

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Taunton Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility of a drinking water source does not imply poor water quality. Susceptibility is a measure of a water supply's *potential* to become contaminated due to land uses and activities within its recharge area.

Risk refers to the potential for a consumer to drink water of compromised quality.

Water suppliers protect drinking water by monitoring for more than 100 potential contaminants. Water suppliers also implement watershed land management and protection practices, as well as disinfect, filter and otherwise treat reservoir water to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual **Consumer Confidence Report**.

Table 1: Public Water System Information
September 2002

<i>PWS Name</i>	Taunton Water Department
<i>PWS Address</i>	City Hall, 15 Summer Street
<i>City/Town</i>	Taunton, MA 02780
<i>PWS ID Number</i>	4293000
<i>Contact</i>	Robert Bernardo, Assistant Superintendent Water Division
<i>Phone Number</i>	508-821-1049

Introduction

We are all concerned about the quality of the water we drink. Reservoir watersheds may be threatened by potential sources of contamination, including stormwater runoff, improper disposal of hazardous materials and spills. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

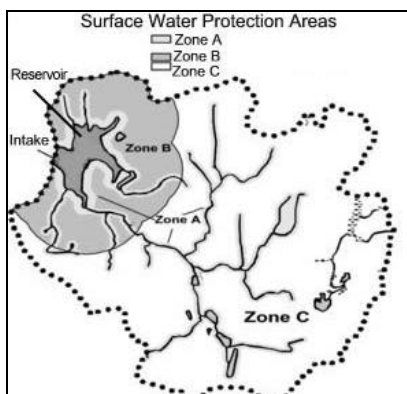
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

This report includes the following sections:

1. Description of the Water System;
2. Land Uses in the Watersheds;
3. Source Water Protection;
4. Source Water Protection Recommendations;
5. Additional Resources Available for Source Water Protection; and
6. Appendices.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Glossary

Protection Zones

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and the watershed boundary.

Section 1: Description of the Water System

Source Name	Source ID	Susceptibility
Assawompset Pond	4293000-01S	High
Elders Pond	4293000-02S	High
Long Pond	4293000-03S	High
Pocksha Pond	4293000-04S	High
Great Quittacas	4293000-05S	High
Little Quittacas	4293000-06S	High

The drinking water supplied by the Taunton Water Department is withdrawn from a complex of six reservoirs: Assawompsett; Elders; Long; Poksha; Great Quittacas; and Little Quittacas. These water bodies are located in Lakeville, Middleborough, Freetown and/or Rochester. The water is treated at the Taunton Water Treatment Plant located on Elders Pond. Color and turbidity are removed through filtration. Bacteria are removed through disinfection. The acidity of the water is reduced for corrosion control and the water is fluoridated before being delivered to the customer. The City of New Bedford also withdraws drinking water from this reservoir system.

For a copy of the Taunton Water Department's Consumer Confidence Report or for current information on monitoring results and treatment, please call the system's contact person listed in Table 1. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Watersheds

The land uses within the watersheds consist of a mix of undeveloped land, high and medium density residential development, businesses, agriculture, recreation, roads, and wildlife. A Geographic Information Systems (GIS) map showing the watershed boundary, Zone A and the percentages of land uses in the watershed is provided as part of this report. Section 3 discusses protection measures implemented by the Taunton Water Department.

Key Land Uses and Protection Issues include:

1. Aquatic Wildlife
2. Agriculture
3. Transportation Corridors
4. Residential Land Uses
5. Recreation
6. Golf Courses

1. Aquatic Wildlife (Birds) - Gulls are seasonally present on the reservoirs. Waterfowl may increase coliform levels through the release of fecal matter into the water and may also carry other bacteria and viruses. Waterfowl management techniques may include noise and visual harassment, habitat modification and control of food sources. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

Aquatic Wildlife Recommendations:

- ✓ Monitor wildlife populations in and around reservoirs.
- ✓ Where necessary, discourage and control aquatic wildlife. See <http://mass.gov/dep/brp/dws/protect.htm> for guidance and permits.

2. **Agriculture** - Cranberry bogs, horse farms, a pig farm and other agricultural operations are located within the watershed. Runoff from these sites can cause fertilizers, bacteria, pesticides and other contaminants to enter the reservoirs. Runoff can be controlled through the use of appropriate Best Management Practices (BMPs) and other source protection measures.

Agricultural Recommendation:

- ✓ The Massachusetts Department of Food & Agriculture's booklet titled "On-Farm Strategies to Protect Water Quality—An Assessment & Planning Tool for Best Management Practices" (December 1996) describes technical and financial assistance programs related to the control of erosion and to the management of nutrients, pests, manure, grazing and irrigation.

3. **Transportation Corridors (Local Roads and Highways)** are located adjacent to the reservoirs and throughout the watersheds. Untreated stormwater and spills are the primary concerns. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes.

Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Potential contaminants may come from automotive leaks, maintenance, washing, or accidents.

This is a difficult issue to address since the roads are not located within the community served by this system. Establishing vegetated buffers, scheduling regular street sweeping and conducting emergency drills can help to address impacts from roads. Appendix A contains a fact sheet titled *DPWs Protect Drinking Water*.

Benefits of Source Protection

- protects drinking water quality at the source
- reduces monitoring costs through the DEP Waiver Program
- treatment can be reduced or avoided entirely, saving treatment costs
- prevents costly contamination clean-up
- preventing contamination saves costs on water purchases and expensive new source development

Contact the DEP staff identified on page seven for more information on Source Protection and the Waiver Program.

Transportation Corridor Recommendations:

- ✓ Regularly inspect watersheds for illegal dumping and spills.
- ✓ Work with local emergency response teams to ensure that any spills within the protection areas can be effectively contained.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Regular street sweeping reduces the amount of potential contaminants in runoff.
- ✓ If storm drainage maps are available, review the maps with emergency

(Continued on page 5)

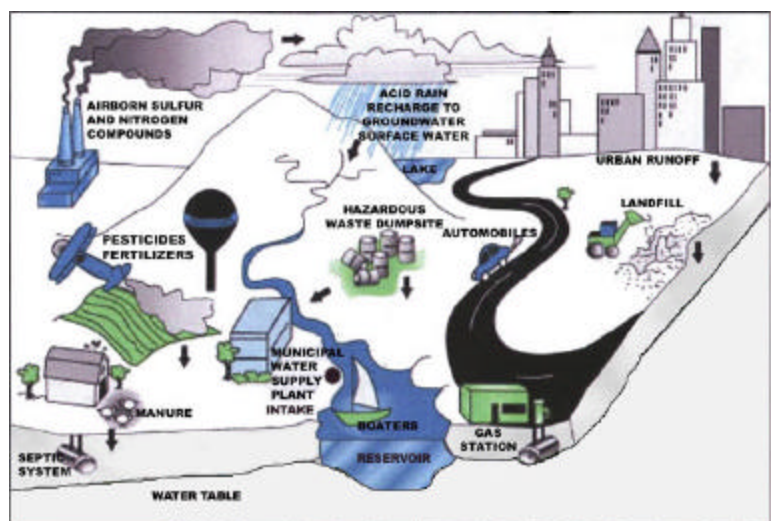


Figure 1: Sample watershed with examples of potential sources of contamination

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Uses in the Watersheds

Activities	Quantity	Threat	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	Few	M	leaks, spills, improper handling, over-application
Manure Storage or Spreading	Few	H	improper handling, runoff
Pesticide Storage or Use	Few	H	leaks, spills, improper handling, over-application
Livestock Operations	Few	H	improper handling, runoff
Commercial			
Golf Courses	2-3	M	fertilizers, pesticides, petroleum products and other chemicals: over-application, improper handling, spills, leaks
Residential			
Fuel Oil Storage (at residences)	Many	M	spills, leaks, improper handling
Lawn Care/Gardening	Many	M	pesticides: over-application, improper storage or disposal
Septic Systems/Cesspools	Many	M	hazardous chemicals, microbial contaminants
Miscellaneous			
Aquatic Wildlife – water-fowl	Many (Seasonal)	H	microbial contaminants
Fishing/Boating	Many	M	fuel and other chemical spills, microbial contaminants
Transportation Corridors	Many	H	fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling

Note:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

response teams. If maps are not available yet, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

4. **Residential** - Approximately 11% of the watersheds consist of residential areas. If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to surface water contamination. Household hazardous wastes include automotive wastes, paints, solvents and other substances that should be disposed of properly at a municipal collection site. If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Improperly applied fertilizers and pesticides can wash off lawns and into surface waters. Pet waste may contain bacteria, parasites or viruses that are health risks.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet *Residents Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Work with town boards to review and provide recommendations on proposed watershed development.

5. **Recreation** - The Massachusetts Drinking Water Regulations, 310 CMR 22.00, prohibit swimming and other bodily contact with a reservoir and its tributaries. Other activities, such as fishing and boating, are left up to the discretion of the local Board of Water Commissioners or like body having jurisdiction over the drinking water sources. In Taunton, the City Council serves in this capacity. If activities are allowed, a set of rules should be adopted by the City Council, inspections should be conducted to ensure adherence to the rules and users should be educated about drinking water protection.

Evidence of horseback riding occurring near Elders Pond, the terminal

reservoir, was observed. The Massachusetts Drinking Water Regulations, 310 CMR 22.00, prohibit animals from within 100 feet of a public drinking water reservoir and its tributaries.

Recreation Recommendations:

- ✓ The water system may establish a more stringent buffer area depending upon local conditions such as soils, topography and proximity to intakes.
- ✓ Educate local horse owners about watershed protection. DEP's web site has nine horsekeeping and manure management fact sheets at mass.gov/dep/consumer/animal.htm.

6. **Golf Courses** - There are 2-3 golf courses within the watersheds. If improperly handled or applied, the pesticides, fertilizers, and other chemicals used at the golf courses can be a potential source of contamination to the water supply.



What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Source Protection Decreases Risk

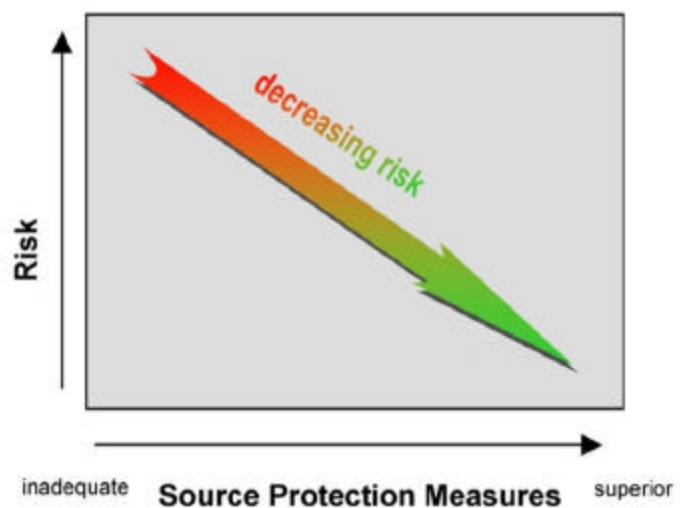


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Golf Course Recommendations:

- ✓ Work with owners/operators of golf courses to encourage the implementation of source protection measures, such as: establishing vegetated buffers to control runoff; minimizing pesticide and fertilizer use; adhering to DEP policy on vehicle washing; and properly storing chemicals.

Section 3: Source Water Protection

As with many water supply protection areas, the system watersheds contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. **The Taunton Water Department is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas.**

Surface Water Supply Protection Plan

The Taunton Water Department has a DEP-approved surface water supply protection plan for Elder's Pond, the terminal reservoir.

Emergency Planning and Response

The Taunton Water Department has an up-to-date emergency response plan and regularly conducts outreach to local firefighters about the water system.

Outreach to Watershed Communities

Public water systems having reservoirs and watersheds located outside the community served by the system are not unusual in Massachusetts. This situation does, however, present a challenge to the water supplier regarding the implementation of source protection measures. The Taunton Water Department monitors conditions in the watersheds and communicates with local officials in Lakeville, Middleborough, Freetown and Rochester as appropriate.

In December 2001, the Water Department sent local officials in the watershed communities a letter requesting to be notified about proposals for new and expanding development. The mailing included educational materials about watershed protection.

Water Department staff work with the City of New Bedford, which also withdraws drinking water from this reservoir system.

Top 5 Reasons to Develop a Local Surface Water Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

For More Information

Contact Mike Quink in DEP's Lakeville Office at (508) 946-2766 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Section 3: Source Water Protection

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In December 2001, the Water Department sent local officials in the watershed communities a letter requesting to be notified about proposals for new and expanding development. The mailing included educational materials about watershed protection.

Water Department staff work with the City of New Bedford, which also withdraws drinking water from this reservoir system.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	NO	Encourage Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with “Public Drinking Water Supply” Signs?	YES	Missing signs should be replaced. Economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	NO	Conduct regular inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	NO	Continue monitoring non-water supply activities in Zone As.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Do the watershed communities have Surface Water Protection Controls that meet 310 CMR 22.20C?	NO	Stay aware of proposed watershed development and provide comments to town boards as appropriate.
Planning		
Does the PWS have a local surface water supply protection plan?	YES	There is an approved plan for Elders Pond. Systems with a DEP-approved plan receive extra credit in DEP’s Source Water Protection Grant Program.
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	NO	Establish committee; include representatives from citizens’ groups, neighboring communities, and the business community.
Do the Boards of Health in the watershed communities conduct inspections of commercial and industrial activities?	NO	For guidance see <i>Hazardous Materials Management: A Community's Guide</i> at www.state.ma.us/dep/brp/dws/files/hazmat.doc .
Does the PWS provide watershed protection education?	NO	Develop an educational program starting with residents in Zone A and owners of horses.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Tisbury Water Works

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Tisbury Water Works
<i>PWS Address</i>	400 West Spring Street
<i>City/Town</i>	Vineyard Haven, Massachusetts 02568
<i>PWS ID Number</i>	4296000
<i>Local Contact</i>	Deacon Perrotta
<i>Phone Number</i>	(508) 693-3100

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

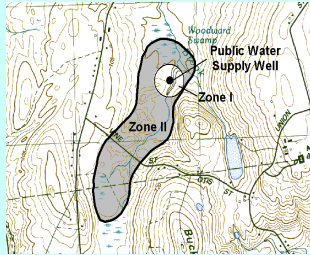
This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Zone II #: 228

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
Sanborn Well #1	4296000-01G
Tashmoo Well #2	4296000-02G

The Tisbury Water Works receives its water from two ground water wells, the Sanborn Well and the Tashmoo Well. Both wells are located in one Zone II recharge area and draw groundwater from the Island's sole source aquifer. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone II.

Both Wells have calcium hydroxide added for corrosion control. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 2: Land Uses in the Protection Areas

The Zone II for Tisbury is predominantly forest and residential land use with very small areas of commercial and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Agricultural activities
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The two Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 30% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water

supply protection areas.

- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

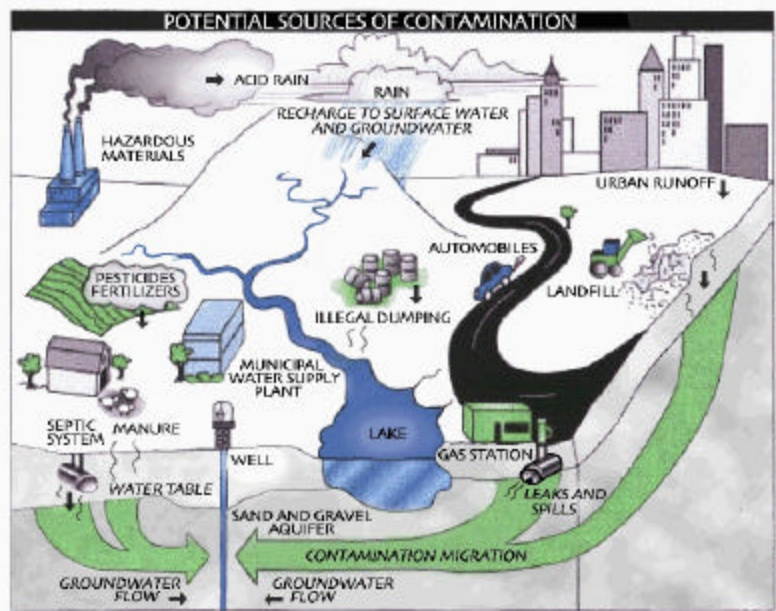
3. Transportation Corridors - Local roads are common throughout the Zone II. Roadway construction, maintenance, and vehicular use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Hazardous Materials Storage and Use – Small areas of the Zone II are used for commercial or industrial land uses. Activities associated with commercial and industrial land use are often the greatest concern when evaluating water supply protection. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

5. Agricultural Activities – There are five agricultural related facilities within the Zone II including a limited livestock operation. If not contained or applied properly, animal waste from barnyards, manure pits and field application are potential sources of contamination to ground and surface water. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins of DEP's Southeast Regional Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

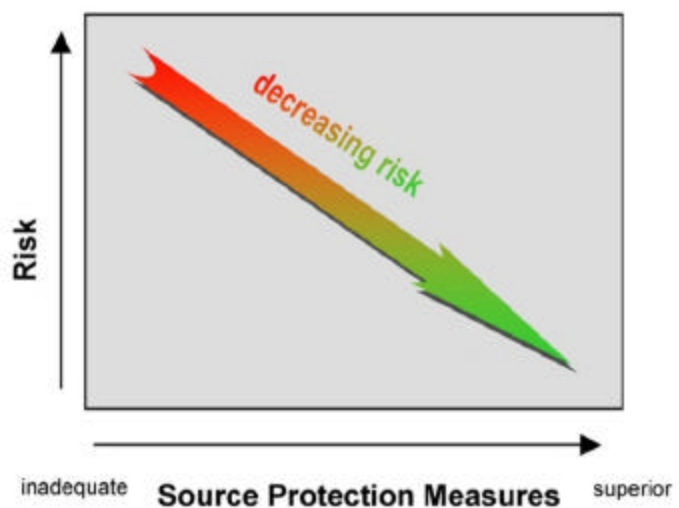


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Livestock Operations	1	M	Manure (microbial contaminants): improper handling
Fertilizer Storage or Use	5	M	Fertilizers: leaks, spills, improper handling, or over-application (cranberry bogs)
Pesticide Storage or Use	5	H	Pesticides: leaks, spills, improper handling, or over-application (cranberry bogs)
Commercial			
Bus and Truck Terminals	1	H	Fuels and maintenance chemicals: spills, leaks, or improper handling (Carroll's Trucking)
Medical Facilities	1	M	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (Jasny Veterinarian)
Photo Processors	1	H	Photographic chemicals: spills, leaks, or improper handling or storage (Wooden Tent Photo)
Sand And Gravel Mining/Washing	1	M	Heavy equipment, fuel storage, clandestine dumping: spills or leaks
Residential			
Fuel Oil Storage (at residences)	1146	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	1146	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	1146	M	Hazardous chemicals: microbial contaminants, and improper disposal
Industrial			
Hazardous Materials Storage	few	H	Hazardous materials: spills, leaks, or improper handling or storage

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Miscellaneous			
Aboveground Storage Tanks	some	M	Materials stored in tanks: spills, leaks, or improper handling
Clandestine Dumping	few	M	Debris containing hazardous materials or wastes
Landfills and Dumps (Capped)	1	H	Seepage of leachate
Schools, Colleges, and Universities (Elementary)	1	M	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage
Underground Storage Tanks (Residential)	some	H	Stored materials: spills, leaks, or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aeep/>.

6. Protection Planning – Currently, Tisbury does have water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2) and West Tisbury has controls that protect a portion of the Zone II that extends into their town. The Martha's Vineyard Commission recently completed a report titled "Martha's Vineyard Source Water Protection Project" which contains detailed local data on source protection issues for all of the Zone II protection areas on the island. This report is a valuable guide for water suppliers regarding future source protection on the island. The water suppliers and towns on the island should support each other with the implementation of the recommendations made within the report. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Use your Wellhead Protection Committee to implement the long term goals of the Wellhead Protection Plan.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/>

dep/brp/dws/protect.htm.

- ✓ Local controls do not regulate floordrains, work with the Town to pass floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include sand and gravel mining, a capped landfill and a school. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The ownership or control of the Zone Is for the wells.
- Convincing the Town of Tisbury to implement the local controls to meet DEP's Wellhead Protection Regulations found in 310 CMR 22.21(2).
- Developing a Wellhead Protection Plan that outlines the long term source

protection goals for Tisbury Water Works.



Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue regular Zone I inspections, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Coordinate source protection activities island wide using the recommendations found in this report and the "Martha's Vineyard Source Water Protection Project, June 19, 2003" as a guide for decision making.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with livestock owners in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Ensure that non-water supply activities remain out of the Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town "Aquifer Protection District" bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	Continue to work with West Tisbury on Zone II protection controls and other source protection projects.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Continue to implement recommendations of the plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Expand committee to include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

(Continued from page 7)

- ✓ Continue to implement your Wellhead Protection Plan goals.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 1

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
39804	TISBURY LANDFILL	VINEYARD HAVEN RD/STATE HWY	TISBURY	Sanitary Landfill	Landfill

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
No DFS registered Underground Storage Tanks were identified during the assessment.							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

* Above Ground Tank

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
No DEP Tier Classified Sites were identified during the assessment.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Source Water Assessment Program (SWAP) Report For West Tisbury Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
July 18, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	West Tisbury Elementary School
PWS Address	Old County Road
City/Town	West Tisbury, Massachusetts
PWS ID Number	4296005
Local Contact	John Powers
Phone Number	508-696-0105

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4296005-01G	172	467	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The West Tisbury Elementary School is a public water supply currently serving a population of 465 students and staff. The School is served by Well #1 that is located on the northern edge of the school's athletic field. Well #1 is 6-inch diameter well drilled to final depth of 115 feet. The well is located in a sand and gravel aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. Clay) that can prevent contaminant migration. The well was developed under the Department's new source approval process in 1996. The average daily withdrawal for the well is limited to 3000 gallons per day, based on the current Zone I of 172 feet and the Interim Wellhead Protection Area (IWPA) of 467 feet. The IWPA provides a protection area for a water supply when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. A diesel

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

generator provides emergency power.

On December 17, 1997, the Department approved a treatment system for corrosion control for the well serving the West Tisbury Elementary School. The system utilizes calcite as a filter media to adjust the pH of the water. For current information on monitoring results and treatment, please contact the public water system contact person listed above in Table I.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **An Underground Storage Tank (UST) With Heating Oil; and**
3. **Storage and Use of Oil/Hazardous Materials.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains athletic fields and playgrounds. The public water supplier does own and/or control all land encompassed by the Zone I. Currently, no fertilizer is used within the Zone I, according to school staff. Please note that systems and not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Keep non-water supply activities out of Zone I.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
2. **Underground Storage Tank (UST)** – There is a 6000 gal. UST fuel tank located approximately 400 feet Southeast of Well #1. The tank is double walled, with cathodic protection and leak detection. If managed improperly, an UST in IWPA containing petroleum products is a concern due to the potential threat posed by release of large quantities of fuel.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Below Ground	No	Well #1	High	6000 gal. heating oil tank
Storage and use of oil/hazardous materials	No	Well #1	Moderate	Small quantities of gasoline, lubricants and cleaning supplies
Athletic Field	Well #1	Well #1	Moderate	Continue not to use fertilizer or pesticides in Zone I
Fuel Storage Above Ground	No	Well #1	Moderate	Diesel tank for generator is double walled with secondary containment
Transformer	No	Well #1	Low	
Industrial Wastewater to septic system	No	No	-	Non-sanitary waste to septic system from labs
Structures	No	Well #1	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use /

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Recommendations:

- ✓ Routinely check vacuum pressure gauge located in the basement of school.
- ✓ During refilling of UST, ensure that the operator of the oil transport tanker does not leave the vehicle while the UST is being filled.
- ✓ Ensure that the delivery operator has determined the tanks available oil capacity to prevent overfilling (refer to 527 CMR 8.00).
- ✓ Consult with the local fire department for any additional local code requirements USTs.

3. Hazardous Waste/Material Storage in IWPA - Boiler treatment chemicals, petroleum products (e.g. gasoline, lubricants, etc.) janitorial supplies and other chemical storage are located in the school basement.

Recommendation Implemented:

- ✓ The public water supply certified operator has instructed school staff to remove all cleaning supply supplies and potentially hazardous materials from the basement areas to areas that have containment.

Other activities noted during the assessment: There is a backup generator that has a double walled AST for diesel fuel storage. The generator and AST are located approximately 400 feet south-southwest of Well #1. If managed improperly, an AST in the IWPA containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel. Conduct regular inspections of the Zone I. Look for evidence of vandalism and check above ground tanks for leaks.

There is one transformer located approximately 200 feet south of Well #1. All electrical transformers contain oil and depending on the age of the transformer, the oil may contain PCBs. For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement.

According to school staff, discharge from the science classroom is routed to an acid neutralization tank and finally to the on-site septic system. Science classroom waste is considered industrial wastewater and is required to go to tight tank or sewer. Please contact Frank Mezzacappa in the Department's water pollution control section at telephone # (508) 946-2723 in order to discuss your management options.

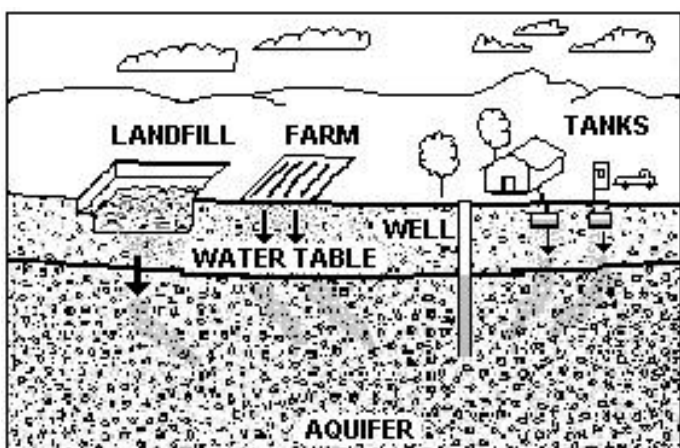


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the Well #1 susceptibility to contamination. Drinking water protection signs have been posted at the facility. West Tisbury Elementary School should review and adopt the **key recommendations** above and the following:

Zone I:

- ✓ Prohibit public access to the well through locking facilities, and gating roads.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, and check any above ground tanks for leaks, etc.

For More Information:

Contact *Mark Dakers* in DEP's Lakeville Office at 508-946-2847 more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

- ✓ Continue to not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance. Roof runoff from the school is transported to a below ground storm water infiltration field located approximately 400 feet south-southwest of Well #1.

Facilities Management:

- ✓ Septic system leaching fields are not located in the IWPA for Well #1. The Department recommends that septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in West Tisbury to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Pesticide Use Fact sheet
- Fertilizer Use Fact Sheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Island Cohousing

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
November, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Island Cohousing
PWS Address	Stony Hill Road
City/Town	Tisbury, Massachusetts
PWS ID Number	4296013
Local Contact	Craig Saunders
Phone Number	(508) 693-1578

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	4296013-01G	196	750	Moderate
Well No. 2	4296013-02G	196	750	Moderate
Well No. 3	4296013-03G	196	750	Moderate
Well No. 4	4296013-04G	196	750	Moderate
Well No. 5	4296013-05G	196	750	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The five wells for Island Cohousing are located northeast of Head of the Pond Way. All wells have a Zone I radius of 196 feet and an Interim Wellhead Protection Area (IWPA) radius of 750 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Activities in Zone Is;**
2. **Residential Land Uses;**
3. **Roads and Driveways; and,**
4. **Aquatic Wildlife**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well meets DEP's restrictions, which only allow water supply related activities in Zone Is.

Recommendations:

- ✓ Conontinue to prevent non-water supply related activities from occurring in the Zone Is.
- 2. **Residential Land Uses** –All of the residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:
 - ✓ **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone Is	IWPAs	Threat	Comments
Fuel Oil Storage	No	Yes	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care/Gardening	No	Yes	Moderate	Encourage residents in proper storage, disposal, and application of pesticides.
Septic Systems	No	Yes	Moderate	See septic systems brochure in the appendix
Roads and Driveways	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Aquatic Wildlife	Yes	Yes	Low	Microbial contaminants

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.

- ✓ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- ✓ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- ✓ **Stormwater** - Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

3. **Roads and Driveways** - Local roads and driveways are located within the IWPAs. Roads are potential sources of contamination due to salting of roadways and leaks or spills of fuels and other hazardous materials during accidents.

Recommendation:

- ✓ Contact the local fire department to ensure that the IWPAs are included in Emergency Response Planning.
 - 4. **Aquatic wildlife** - A pond is located within the Zone Is. Ducks, geese, and other wildlife waste in and around ponds are a potential source of contamination to the water supply.
- Recommendation:**
- ✓ Discourage wildlife by prohibiting the feeding of ducks, geese and wildlife.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce

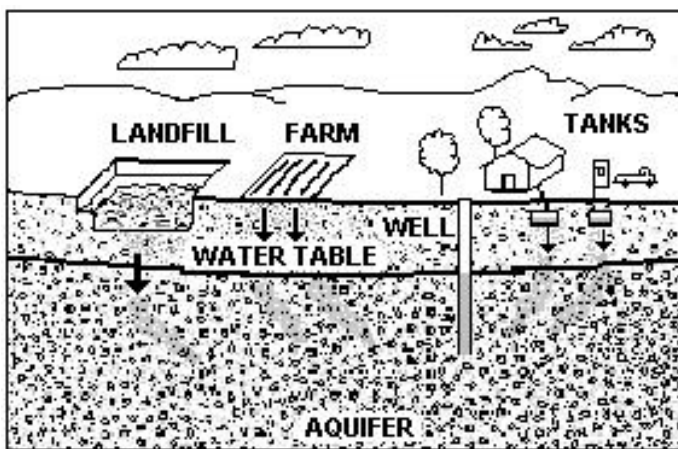


Figure 1: Example of how a well could become contaminated by different land uses and activities.

the wells' susceptibility to contamination. Island Cohousing is commended for only allowing water supply related activities to occur in the Zone Is, for having a formal Emergency Response Plan for dealing with spills or other emergencies, and for holding monthly meetings with residents to discuss water related issues. Island Cohousing should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and groundskeepers. Post labels as appropriate on raw materials and hazardous waste.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on the property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Walpole Water Department

What is SWAP?

The Source Water Assessment Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Walpole Water Department
<i>PWS Address</i>	Town Hall/135 School Street
<i>City/Town</i>	Walpole, Massachusetts 02081
<i>PWS ID Number</i>	3307000
<i>Local Contact</i>	Rick Mattson - Superintendent
<i>Phone Number</i>	(508) 660-7308

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

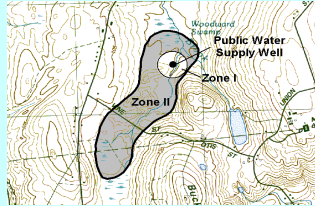
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 107

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
Mine Brook Well #1	3307000-01G
Mine Brook Well #2	3307000-02G
Mine Brook Well #3	3307000-03G
Mine Brook Well #5	3307000-11G

Zone II #: 478

Susceptibility: High

<i>Well Names</i>	<i>Source IDs</i>
Washington Well #3	3307000-05G
Washington Well #2	3307000-06G
Washington Well #5	3307000-08G
Washington Well #6	3307000-09G
Washington Well #4	3307000-10G
Neponset Well #1	3307000-12G
Neponset Well #2	3307000-13G

The wells for the Walpole Water Department are located within two separate water supply protection areas, with portions extending into the towns of Foxborough, Medfield, and Sharon. Each well has a Zone I radius of 400 feet. The wells are located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map of the Zone II. The Town is in the process of reactivating Mine Brook Well #2, which has been inactive for several years. The Town is also in the process of replacing Washington Well #4 by two new wells, #4-A and #4-B.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

Section 2: Land Uses in the Protection Areas

The Zone IIs for Walpole are a mixture primarily of residential and forested land uses, with a small portion consisting of industrial and agricultural (refer to attached map for details).

Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Hazardous Materials Storage and Use
3. Residential Land Uses
4. Oil or Hazardous Material Contamination Sites
5. Comprehensive Wellhead Protection Planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of Walpole's wells:

Mine Brook Well #1 and Well #5: There are high school athletic fields within the Zone I of these wells.

Mine Brook Well #2 and Well #3: There is an active rail line within the Zone I of these wells.

Washington Well #2: There is a local road and a utility transmission line in the Zone I of this well.

Washington Well #5: There is a home that is connected to municipal sewer, a local road, and a utility transmission line in the Zone I of this well.

Zone I Recommendations:

- ✓ Coordinate efforts with landowners to identify the location of septic systems, and if needed, determine the feasibility of relocating septic systems outside of the Zone I.
- ✓ To the extent possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

- ✓ Agreement Options - Attempt to obtain a *Memorandum of Understanding*.

Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or

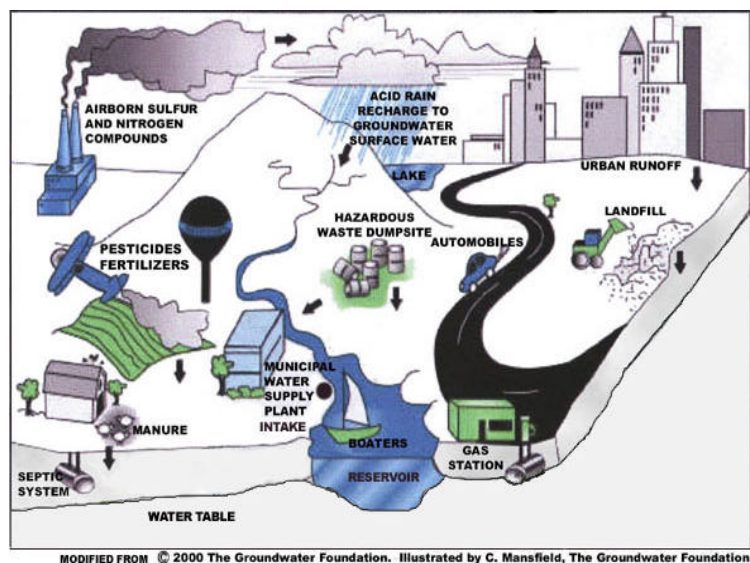


Figure 1: Sample watershed with examples of potential sources of contami-

other hazardous or toxic substances, including septic system cleaners into the septic system, and that the system will be pumped at a specific frequency. The application of lawn care chemicals could also be restricted. Understanding how activity threatens drinking water quality is an important component of developing an effective MOU.

- ✓ Work with the local Conservation Commission to make sure the wetland/stream resource areas are properly delineated in the field prior to the application of pesticides and that the supplier reviews the Yearly Operating Plan (YOP) from the railroad and utility companies. These plans are approved directly by the Department of Food and Agriculture, with copies being sent to the local Conservation Commission.

2. Hazardous Materials Storage and Use – Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in Underground Storage Tanks

(USTs) and Aboveground Storage Tanks (ASTs). If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP’s for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure “Industrial Floor Drains” for more information.

3. Residential Land Uses – Approximately 21% of the combined Zone IIs consist of residential areas, some of which are still served by private septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #/ Source ID#	Potential Source of Contamination
Agricultural				
Pesticide Storage or Use	1	H	107	Leaks, spills, improper handling, or over-application of pesticides
Commercial				
Gas Stations	3	H	478	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Railroad Tracks and Yards	2	H	107, 478	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Sand and Gravel Mining/Washing	1	M	107	Spills or leaks from heavy equipment, fuel storage, clandestine dumping
Industrial				
Electronics/Electrical Manufacturers	1	H	478	Spills, leaks, or improper handling or storage of chemicals and process wastes
Industry/Industrial Parks	11	H	478	Spills, leaks, or improper handling or storage of industrial chemicals and metals
Residential				
Fuel Oil Storage (at residences)	numerous	M	107, 478	Spills, leaks, or improper handling of fuel oil
Lawn Care/Gardening	numerous	M	107, 478	Over-application or improper storage and disposal of pesticides
Septic Systems/Cesspools	numerous	M	107, 478	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous				
Large Quantity Hazardous Waste Generators	2	H	478	Spills, leaks, or improper handling or storage of hazardous materials and waste
NPDES Locations	1	L	107	Improper disposal of hazardous material and wastes

Activities	Quantity	Threat*	Zone II #/ Source ID#	Potential Source of Contamination
Miscellaneous				
Oil or Hazardous Material Sites	4	--	478	Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road and Maintenance Depots	1	M	478	Spills, leaks, or improper handling or storage of deicing materials, automotive fluids, fuel storage, and other chemicals
Schools, Colleges, and Universities	2	M	107, 478	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small Quantity Hazardous Waste Generators	5	M	478	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	Numerous	L	107, 478	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way Type: <u>electric & gas</u>	3	L	107, 478	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	2	M	478	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	10	H	478	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	11	L	107, 478	Spills, leaks, or improper handling or storage of hazardous materials and waste
Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <p>? THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.</p>				

(Continued from page 4)

- ✓ Promote BMPs for stormwater management and pollution controls.
- ✓ Review railroad right-of-way Yearly Operating Plans to ensure that water supplies are protected during vegetation control.

4. Presence of Oil or Hazardous Material Contamination Sites – The Zone II for the Washington and Neponset Wells contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 3-0004812, 3-0018926, 4-0000261, and 4-0001164. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

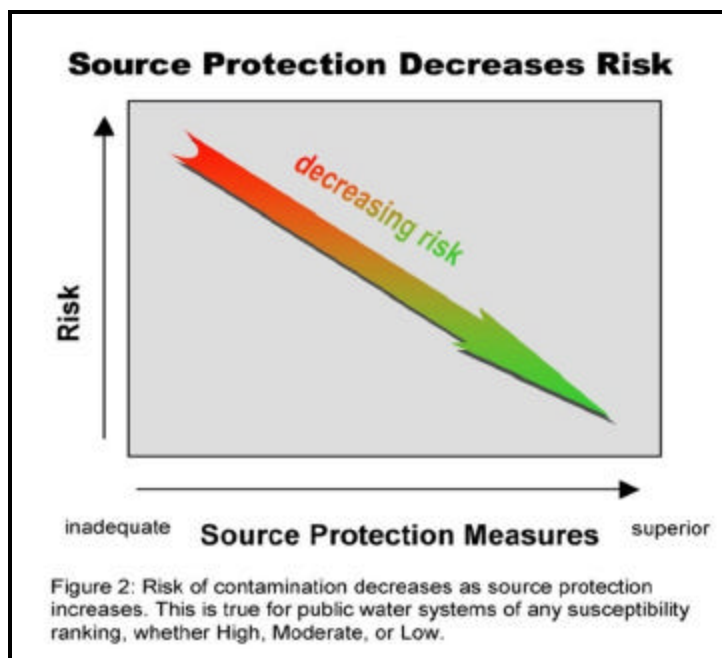
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

5. Protection Planning – Walpole has water supply protection controls that meet DEP's Wellhead Protection regulations 310 CMR 22.21(2). These controls were adopted in June 2001. Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). Occasionally update local controls to meet changes in current regulations. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.

Other land uses and activities within the Zone II that are potential sources of contamination are included in Table 2. Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.



When you wash your car in the driveway,
Remember
you're not just washing your car in the driveway.

All the soap, suds, and oily grit runs along the curb. Then into a storm drain and directly into our lakes, rivers, and streams. And that causes pollution which is unhealthy for everyone. So how do you avoid this whole mess? Easy! Wash your car on the grass or gravel instead of the street. Or better yet, take it to a car wash where the water gets treated or recycled.

The Massachusetts Department of Environmental Protection One Winter Street Boston, MA 02108

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES (Washington Well #3 and #4; Neponset Well # 1 and #2)	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
	NO (Mine Brook Well #1, #2, #3, and #5; Washington Well #2, #5, and #6)	To the extent possible, remove non-water supply activities from each Zone I to comply with DEP's Zone I requirements. Investigate options for gaining ownership or control of the Zone I for groundwater sources.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	NO	Post all wells with "Public Drinking Water Supply" or "No Trespassing" signs. Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas. Pay special attention to fenced areas, lighting, and signs of forced entry into well houses and pump stations.
Are water supply-related activities the only activities within the Zone I?	YES (Washington Well #3 and #4; Neponset Well # 1 and #2)	Continue monitoring for non-water supply activities in Zone Is.
	NO (Mine Brook Well #1, #2, #3, and #5; Washington Well #2, #5, and #6)	Monitor non-water supply activities in Zone I, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town's bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	SOME	Sharon has adopted land use controls that include Walpole's source protection areas. Work with Foxborough and Medfield to include Walpole's Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish a committee with representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Continue with Walpole's inspections, and enforcement of local bylaw. For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	SOME	Currently, the only outreach is through the annual Consumer Confidence Report. Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. Walpole is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Adopting a local bylaw for the control and management of hazardous materials. This bylaw is implemented through the Board of Health, with additional inspection support from the Fire Department. The BOH requires an annual report of hazardous material storage.
- Adopting a local bylaw that meets DEP's prohibited land uses within a Zone II.
- Department of Public Works involvement in a self-audit program for storage and handling of hazardous material.
- Working with the Town of Sharon on construction projects that are proposed in the section of the Zone II that extends into Sharon.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above, and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

- 1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- 2. MA DEP SWAP Strategy
- 3. Land Use Pollution Potential Matrix
- 4. Draft Land/Associated Contaminants Matrix

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN WALPOLE WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
28469	COOKS TOWING	2222 PROVINENCE HIGHWAY	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR
136183	CUMBERLAND FARMS #2008	1185 WASHINGTON STREET	WALPOLE	FUEL DISPENSER	FUEL DISPENSER
134306	LORUSSO S M & SONS INC	440 WEST STREET	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR
332167	MICREX CORPORATION	17 INDUSTRIAL ROAD	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
31796	MINUTEMAN TRUCKS INC	2181 PROVIDENCE HIGHWAY	WALPOLE	DISCHARGE	INDUSTRIAL SEWER WASTE WATER
31796	MINUTEMAN TRUCKS INC	2181 PROVIDENCE HIGHWAY	WALPOLE	HANDLER	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
31796	MINUTEMAN TRUCKS INC	2181 PROVIDENCE HIGHWAY	WALPOLE	HANDLER	SMALL QUANTITY GENERATOR
367870	MOBIL 12804	980 PROVIDENCE HIGHWAY	WALPOLE	FUEL DISPENSER	FUEL DISPENSER
193837	PHARMACIA DELTEC INC	1600 PROVIDENCE HIGHWAY RTE 1	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR
335505	PROCESS ANALYZERS LLC	25 WALPOLE PARK SOUTH DRIVE	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR
125213	ROSENFELD CONCRETE COMPANY	331 WEST STREET	WALPOLE	PLANT	AQ NATURAL MINOR W/ PTE < OR = 25% OF MAJ
303462	SCHINDLER ELEVATOR CORPORATION	4 WALPOLE PARK - SOUTH DRIVE	WALPOLE	HANDLER	SMALL QUANTITY GENERATOR
360865	SM LORUSSO & SONS INC	331 WEST STREET	WALPOLE	FUEL DISPENSER	FUEL DISPENSER

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
327805	STADIUM MOBIL	2285 PROVIDENCE HIGHWAY	WALPOLE	FUEL DISPENSER	FUEL DISPENSER
367833	TOPCOAT DIVISION OF GAF MATERIALS CORP	24 INDUSTRIAL ROAD	WALPOLE	HANDLER	SMALL QUANTITY GENERATOR
367833	TOPCOAT DIVISION OF GAF MATERIALS CORP	24 INDUSTRIAL ROAD	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
32462	TRM CORPORATION	24 WALPOLE PARK SOUTH UNIT 8	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR
27587	WEST SAND & GRAVEL	331 WEST STREET	WALPOLE	HANDLER	VERY SMALL QUANTITY GENERATOR
30886	WALPOLE TOWN OF D P W	1385 WASHINGTON STREET	WALPOLE	HANDLER	RECYCLER - BURNER/BLENDER
26766	NEW ENGLAND TAP CO	FOX HILL PARK	FOXBOROUGH	HANDLER	VERY SMALL QUANTITY GENERATOR
741	STADIUM ASSOC LTD PRTNRSHIP	U.S. ROUTE 1	FOXBOROUGH	GROUND WATER DISCHARGE	GROUND WATER DISCHARGEWATER MINOR
34251	VERIZON NEW ENGLAND INC	23 PERRY DRIVE	FOXBOROUGH	HANDLER	VERY SMALL QUANTITY GENERATOR
34251	VERIZON NEW ENGLAND INC	23 PERRY DRIVE	FOXBOROUGH	APPROVED	INDUSTRIAL WASTE WATER HOLDING TANK
132202	BRODIE INC	1180 GENERAL EDWARDS HIGHWAY	SHARON	HANDLER	VERY SMALL QUANTITY GENERATOR
132202	BRODIE INC	1180 GENERAL EDWARDS HIGHWAY	SHARON	HANDLER	SMALL QUANTITY GENERATOR
177503	DYNISCO	4 COMMERCIAL STREET	SHARON	DISCHARGE	BELOW IWW REGULATED THRESHOLDS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
177503	DYNISCO, INC.	4 COMMERCIAL STREET	SHARON	TURA REPORTER	BELOW TUR REGULATED THRESHOLDS
193125	MINUTEMAN FORD TRUCK SALES	ROUTE 1	SHARON	HANDLER	SMALL QUANTITY GENERATOR
131187	SENIOR FLEXONICS INC METAL BELLOWS DIV	1075 PROVIDENCE HIGHWAY	SHARON	HANDLER	LARGE QUANTITY GENERATOR

UNDERGROUND STORAGE TANKS WITHIN WALPOLE WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
CUMBERLAND FARMS #12738	1185 WASHINGTON STREET	WALPOLE	GAS STATION	12000	GASOLINE
CUMBERLAND FARMS #12738	1185 WASHINGTON STREET	WALPOLE	GAS STATION	6000	GASOLINE
MOBIL	980 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	10000	GASOLINE
MOBIL	980 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	10000	GASOLINE
MOBIL	980 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	10000	GASOLINE
MOBIL	980 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	10000	GASOLINE
STADIUM MOBIL	2285 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	8000	GASOLINE
STADIUM MOBIL	2285 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	6000	GASOLINE
STADIUM MOBIL	2285 PROVIDENCE HIGHWAY	WALPOLE	GAS STATION	6000	GASOLINE
WALPOLE HIGH SCHOOL	275 COMMON STREET	WALPOLE	MUNICIPAL	10000	FUEL OIL

For More Information On Underground Storage Tanks, Visit The Massachusetts Department Of Fire Services Web Site: <http://www.state.ma.us/dfs/ust/usthome.htm>
Note: This Appendix Includes Only Those Facilities Within The Water Supply Protection Area(s) That Meet State Reporting Requirements And Report To The Appropriate Agencies. Additional Facilities Located Within The Water Supply Protection Area(s) Should Be Considered In Local Drinking Water Source Protection Planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Walpole Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN).

RTN	Release Site Address	Town	Contaminant Type
3-0004812	1185 Washington Street	Walpole	Oil
3-0018926	1611 Washington Street	Walpole	Oil
4-0000261	1075 Providence Highway	Sharon	Oil
4-0001164	23 Perry Drive	Foxborough	Oil

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Wareham Fire District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Wareham Fire District
<i>PWS Address</i>	2550 Cranberry Highway
<i>City/Town</i>	Wareham, Massachusetts
<i>PWS ID Number</i>	4310000
<i>Local Contact</i>	Michael Martin
<i>Phone Number</i>	(508) 295-0450

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

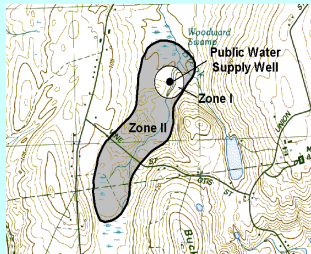
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 383

Susceptibility: High

Well Names	Source IDs
Maple Springs Well #1	4310000-01G
Maple Springs Well #2	4310000-02G
Maple Springs Well #3	4310000-03G
Maple Springs Well #4	4310000-04G
Maple Springs Well #5 (Inactive)	4310000-05G
Seawood Springs Well #6	4310000-06G
Seawood Springs Well #7	4310000-07G

Wareham Fire District's (the District's) water originates from six gravel packed wells with depths of 60-80 feet within the Plymouth-Carver aquifer. The wells are located in isolated areas of Maple Springs and Seawood Springs. Each well has a Zone I of 400 feet. All of the wells are located in one Zone II recharge area, (DEP #383) in Wareham that extends in to the Town of Plymouth. A new proposed well site is located north of the Seawood Springs wells, an assessment of the proposed well is not included in this report. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone II.

The only chemical addition to the water is lime (calcium hydroxide) for the purpose of raising the water's pH to a non-corrosive level between 7.0 and 7.8. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for the District is dominated by forest and open land with very small areas of residential land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix A.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Agricultural activities
5. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The seven Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Maple Springs Wells #3 & #4 and Seawood Springs #6 - The Zone Is for these wells are intersected by an electric power transmission line right of way.

Zone I Recommendations:

- ✓ Ensure that vegetation control of transmission lines does not include chemicals (herbicides) and that only mechanical controls are used.
- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses –None of the residential areas within the Zone II have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of

contamination due to leaks or spills of the fuel oil they store.

- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

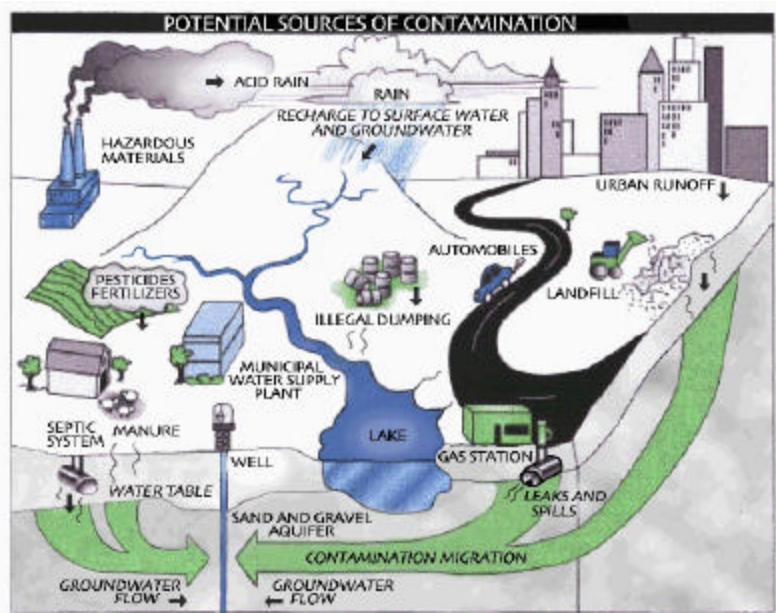
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix C and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Local roads exist within the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drains and the drainage system along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. Best management practices include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

4. Agricultural Activities – There are several cranberry bogs within the Zone II. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your

water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.

- ✓ Ensure that farmers within the Zone II maintain a pesticide license or certification with the Massachusetts Department of Food and Agriculture including all applicable training and recertification courses.
- ✓ Follow applicable Best Management Practices as published by the University of Massachusetts Cranberry experiment station.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture's Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

(Continued on page 6)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

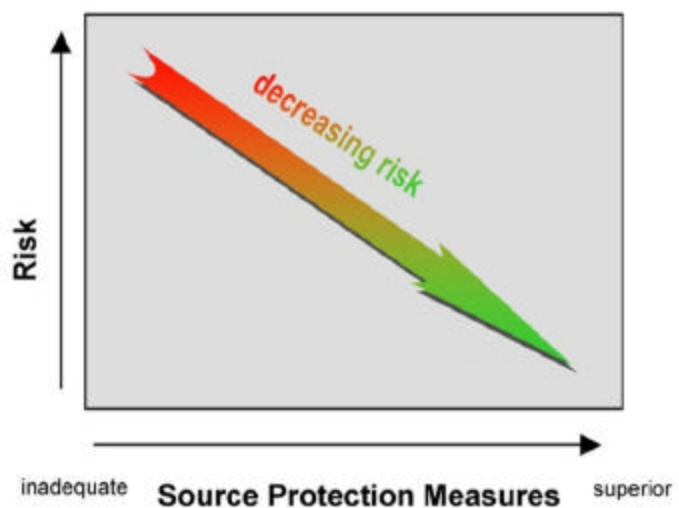


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Fertilizer Storage or Use	few	M	Fertilizers: leaks, spills, improper handling, or over-application
Pesticide Storage or Use	few	H	Pesticides: leaks, spills, improper handling, or over-application
Residential			
Fuel Oil Storage (at residences)	~ 700	M	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	~ 700	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	~ 700	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Aquatic Wildlife	some	L	Microbial contaminants
Clandestine Dumping	some	H	Debris containing hazardous materials or wastes
Prisons	1	M	Solvents, microbial waste, and other chemicals: spills, leaks, or improper handling or storage (historical facility)
Transmission Line Rights-of-Way - Type: Electrical and gas	2	L	Corridor maintenance pesticides: over-application or improper handling; construction
Very Small Quantity Hazardous Waste Generator	1	L	Hazardous materials and waste: spills, leaks, or improper handling or storage (Business in home, See Appendix A)

Notes:

- When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
- For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
- For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

5. Protection Planning – Currently, the District meets the “best effort” requirement of DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Establish a protection team, and use the protection team to implement the goals of the Wellhead Protection Plan for the District.
- ✓ Continue “best effort” with local officials to include wellhead protection controls for your Zone II that meet MA Wellhead Protection Regulations 310 CMR 22.21(2). If there are no local controls or they do not meet the current regulations, encourage them to adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include an old prison site. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

identified, specific recommendations like those below should be used to better protect your water supply.



Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The acquisition of undeveloped lands within the Zone II recharge area.
- Supporting residential growth management within the Zone II.
- Conducting an independent study of pesticide and herbicide impacts on groundwater in the Zone II.

Source Protection Recommendations:

(Continued on page 8)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring electrical transmission line activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The District has meet the "best effort requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Encourage Plymouth to include the District's Zone II in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Update as needed. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	NO	Create a plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the District have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, residential and agricultural uses within the Zone II.

(Continued from page 6)

To better protect the sources for the future:

- ✓ Partner with cranberry bog owners to ensure proper application, handling and storage of pesticides and fertilizers.
- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Convene a Wellhead Protection Committee with members representing local government, businesses, citizen's groups, the water department and other stakeholders.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix C.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
375139	Wareham Burner	71 Mayflower Lane	Wareham	HANDLER	VSQG	Very Small Quantity Generator of Hazardous Waste

Underground Storage Tanks

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
None Identified							

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
No DEP Tier Classified Sites were identified during the assessment.			

For more location information, please see the attached map. The map lists the release sites by RTN.

* Site recently classified, not reflected in current GIS map.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Onset Fire District

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Onset Fire District
<i>PWS Address</i>	15 Sand Pond Rd.
<i>City/Town</i>	Wareham, Massachusetts
<i>PWS ID Number</i>	4310003
<i>Local Contact</i>	William Gay
<i>Phone Number</i>	(508) 295-0603

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

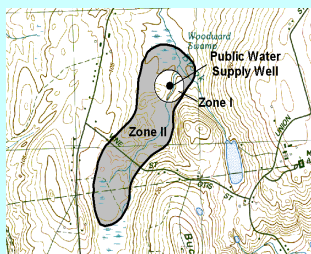
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 165

Susceptibility: High

Well Names	Source IDs
GP Well #5	4310003-03G
GP Well #6	4310003-04G

Zone II #: 356

Susceptibility: Moderate

Well Names	Source IDs
GP Well #4	4310003-01G
GP Well #3	4310003-02G

The four wells for the Onset Fire District are located in two Zone II. Each well has a Zone I of 400 feet. The Zone II #356 extends into the Town of Plymouth, while Zone II #165 is completely within the Town of Wareham. The Onset Fire District also has an emergency source, the Sand Pond Reservoir, which was removed from active service to avoid the need to install filtration technology required by the Surface Water Treatment Rule. This source is not included in this report. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone II.

Water from the wells is treated with sodium hydroxide to adjust pH for corrosion control purpose. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for the Onset Fire District are primarily forested, with areas of residential and commercial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Zone I Protection
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Agricultural activities
7. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I Protection – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The four Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 10% of the Zone II consist of residential areas. Most of the areas have public sewers, but a small percentage use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential

contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

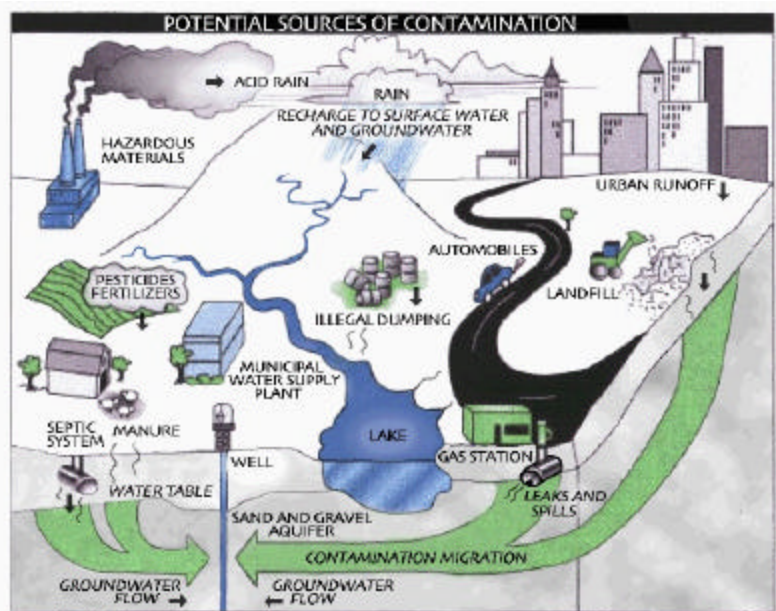
- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix B and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP's web site for additional

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.

3. Transportation Corridors - Route 25 and Route 6 run through both Zone II. Local roads are common throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Railroad tracks run through the southern tip of Zone II #165. Rail corridors serving passenger or freight trains are potential sources of contamination due to chemicals released during normal use, track maintenance, and accidents. Accidents can release spills of train engine fluids and commercially transported chemicals.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local officials during their review of the railroad right of way Yearly Operating Plans to ensure that water supplies are protected during

vegetation control.

4. Hazardous Materials Storage and Use – A small percentage of the land area within the Zone II is commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix B and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.

(Continued on page 7)

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

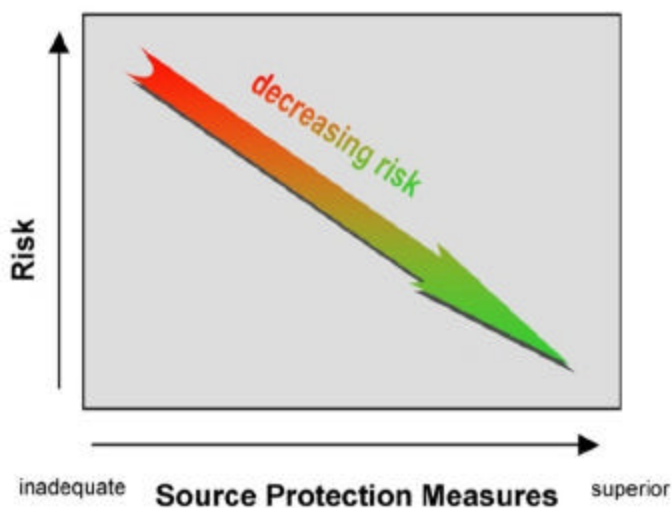


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II) *See Table 2 notes on Page 10.

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II#	Potential Source of Contamination
Agriculture				
Pesticide Storage or Use	5	H	#165	Pesticides: leaks, spills, improper handling, or over-application
Commercial				
Gas Stations	1	H	#165	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Service Stations/ Auto Repair Shops	1	H	#165	Automotive fluids and solvents: spills, leaks, or improper handling
Railroad Tracks And Yards	1	H	#165	Herbicides: over-application or improper handling; fuel storage, transported chemicals, and maintenance chemicals: leaks or spills
Industrial				
Industry/Industrial Parks	1	H	#165	Industrial chemicals and metals: spills, leaks, or improper handling or storage
Machine/ Metalworking Shops	1	H	#165	Solvents and metal tailings: spills, leaks, or improper handling
Residential				
Fuel Oil Storage (at residences)	5+	M	Both	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	5+	M	Both	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	12+	M	Both	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Aquatic Wildlife	2	L	Both	Microbial contaminants
Oil or Hazardous Material Sites	1	--	#165	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Stormwater Drains/ Retention Basins	25+	L	#165	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transportation Corridors	2	M	Both	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	1	H	#165	Stored materials: spills, leaks, or improper handling

Activities	Quantity	Threat*	Potential Source of Contamination

- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone II contains a DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40001326. Refer to the attached map and Appendix A for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination site.

6. Agricultural Activities – There are several cranberry bogs in Zone II #165. As is the case for most other crops, the commercial production of cranberries usually requires input of fertilizer and pesticides. Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.

Agricultural Activities Recommendation:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department of Food Agriculture’s Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

7. Protection Planning – Currently, the water supplier has met the “best effort” requirement of DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Update and implement your Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2). If they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of

(Continued on page 9)

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	The Town "Aquifer Protection District" bylaw meets DEP's "best effort" requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?	NO	Work with Plymouth to include Zone II areas in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	YES	Implement the wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial and industrial uses within the Zone II.

(Continued from page 7)

Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include an automotive service station, gas station, and machine/metalworking shop. Refer to Table 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- The acquisition of land within the Zone II.
- Updating the alarm systems protecting the wellheads.
- Working with the Town of Wareham to sewer Zone II residential areas.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a NRCS farm plan to protect water supplies.
- ✓ Implement your Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, and the Key Issues above.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

For more information on grants and loans, visit the Bureau of Resource Protection's web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- B. Additional Documents on Source Protection

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

APPENDIX A – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0001326	3016 Cranberry Highway	Wareham	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Drummer Boy Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
January 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Drummer Boy Condominiums
PWS Address	Off Cannon Hill Road (P.O. Box 5)
City/Town	Wellfleet, MA
PWS ID Number	4318010
Local Contact	Gary Maradian/Russell Tierney
Phone Number	508-362-2508/888-377-7678

Well Name	Source ID#	Zone I (in feet)	IWPA	Source Susceptibility
Well #1	4318010-01G	150	468	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

1. Description of the Water System

Well #1 provides drinking water to the residents of the Drummer Boy condominium cottages in Wellfleet. The well has a Zone I of 150 feet and an Interim Wellhead Protection Area (IWPA) of 468 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (residences, parking, roadways)
2. Local Roads

Table 2: Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Residential, Parking, Roadways	Yes	Yes	M	pesticides and fertilizers from lawn care; leaks or spills of automotive fluids; stormwater; microbial contamination from septic systems
Local Roads	Yes	Yes	M	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way; stormwater contaminants

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The overall ranking of susceptibility to contamination for the well is MODERATE based on the presence of at least one MODERATE threat within the Zone I and IWPA.

1. **Zone I**– The public water system conducts regular inspections and posts water supply protection signs but does not own or control the entire Zone I. Seasonal homes are located within the Zone I and IWPA. The public water system does not meet DEP's Zone I requirements because of non-water supply activities within the Zone I.

Seventy-six percent of the Zone I and IWPA consists of residences. Spills or over-application of pesticides and fertilizers used for lawn care, septic systems and vehicular spills are potential concerns.

Recommendations

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Do not use pesticides or fertilizers within the Zone I.
- ✓ Do not use or store de-icing materials within the Zone I.

2. **Local Roads** – Local roads are located within the Zone I and IWPA. Leaks and spills, vehicular accidents, and over-application or spills of pesticides are potential sources of contamination.

In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

Recommendations

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.
- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

3. Recommendations for Protection

Implementing protection measures will reduce susceptibility to contamination.

Priority Recommendations: Zone I

- ✓ Continue to inspect the Zone I.

Training and Education

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Planning

- ✓ Work with town officials to improve water supply protection.

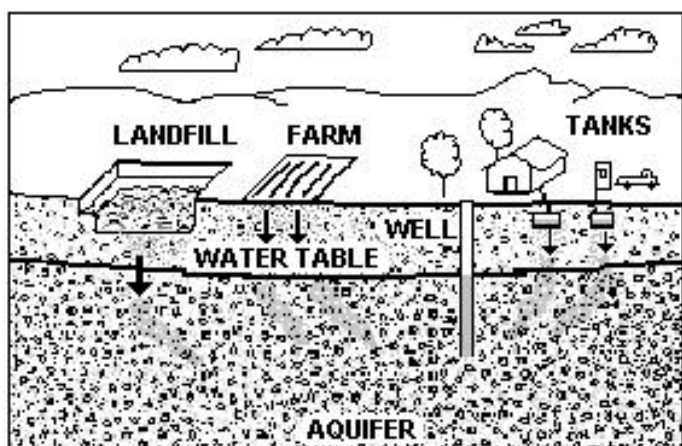


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- Residents Protect Drinking Water fact sheet

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
OCEAN PINES CONDOMINIUMS

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Ocean Pines Condominiums
<i>PWS Address</i>	Route 6, P.O. Box 893
<i>City/Town</i>	Wellfleet, MA 02663
<i>PWS ID Number</i>	4318011
<i>Local Contact</i>	Peter Hall/Russell Tierney
<i>Phone Number</i>	508-349-2127

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

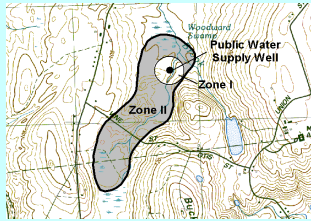
This report includes the following sections.

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: is the larger area that is likely to contribute water to the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Source Information

Susceptibility: High

Well Name	Zone I	IWPA	Source IDs
Well #1	100 feet	422 feet	4318011-01G
Well #2	100 feet	422 feet	4318011-02G

The Ocean Pines condominiums have two active wells. Each well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 422 feet. These terms are defined in the Glossary. The wells have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map for Zone I and IWPA boundaries.

For current information on treatment and the results of water quality monitoring, please contact the public water system contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses within Protection Areas

Land uses and activities that are potential sources of contamination for the wells are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Transportation Corridors
4. Commercial Businesses
5. Transmission Line

The overall ranking of susceptibility to contamination for the system is HIGH, based on the presence of at least one HIGH threat land use within the water supply protection areas, as seen in Table 2.

1. **Land Uses Within Zone I**– The Zone I for the wells is a 100 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. Ocean Pines does not own or control the Zone I but they do post drinking water protection signs and conduct regular inspections. Route 6, condominiums, access roads, parking and a restaurant are located within the Zone I.

Zone I Recommendations

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Do not use fertilizers, pesticides or road salt within the Zone I.

2. **Residential Land Uses** – Condominium buildings and other residences are located within the IWPA. Common potential sources of contamination associated with residential land use include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Residential Land Use Recommendations

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and at www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Work with officials in Wellfleet to improve water supply protection.
- ✓ Encourage the Town of Wellfleet to conduct household hazardous waste collection days.

3. Transportation Corridors -

Route 6, access roads and parking areas are located within the IWPA. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

There is a railroad bed located within the IWPA. The bed is abandoned and is used as a bike trail.

Transportation Corridor Recommendations

- ✓ Identify stormwater drains. Wherever possible, ensure that drains discharge to outside the IWPA.
- ✓ If applicable, encourage Wellfleet to inspect, maintain and clean storm drains on a regular basis. Street sweeping reduces the amount of potential contaminants in runoff.

4. **Commercial**— There are businesses located within the IWPA.

Business Recommendation

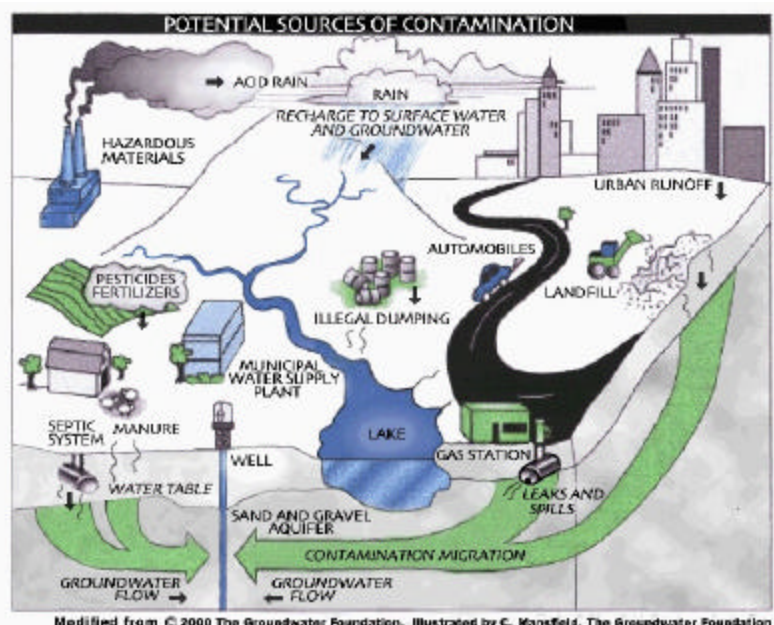
- ✓ Talk with businesses about the public well and about their location within the

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



IWPA.

5. **Transmission Line** - There is a transmission line located within the IWPA. Spills or over-application of pesticides are a concern.

Transmission Line Recommendation

- ✓ Check with the local Conservation Commission to determine whether pesticides are used on the transmission line. The utility is responsible for submitting a copy of their approved Vegetation Management Plan and Yearly Operating Plan to the Town if pesticides are used on the right-of-way. There are state regulatory setbacks and other requirements to help protect drinking water sources from pesticide over-application or spills.

Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – Ocean Pines posts water supply protection signs and conducts inspections of the Zone I.

Protection Planning Recommendations

- ✓ Continue to protect the Zone I and IWPA.
- ✓ Maintain contact with Wellfleet public officials about local water supply protection.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection

As with many water supply protection areas, this system's IWPA contains potential sources of contamination. However, source protection measures

reduce the risk of actual contamination, as illustrated in Figure 2.

The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas by posting signs and conducting regular inspections of the Zone I.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

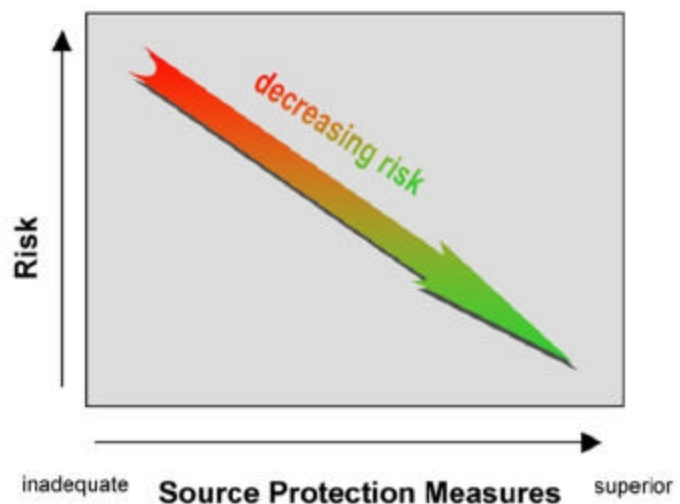


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zone I and IWPA)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential			
Septic Systems	few	M	microbial contaminants; improper disposal of hazardous chemicals
Lawn Care	few	M	spills, over-application or improper storage and disposal of pesticides & fertilizers
Commercial			
Restaurant	1	L	spills in parking lot
Miscellaneous			
Transportation Corridors	Route 6, local roads	H	leaks or spills of fuel, other hazardous materials or pesticides
Transmission Line	1	L	spills or over-application of pesticides



Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	N/A	
Do neighboring communities protect the Zone II areas extending into their communities?	Yes	
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	
Does the PWS have a formal <i>Emergency Response Plan</i> to deal with spills or other emergencies?	YES	Work with the Town’s Local Emergency Planning Committee to conduct drills with local emergency response officials to test procedures.
Does the municipality have a wellhead protection committee?	N/A	Work with the Town of Wellfleet.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	
Does the PWS provide wellhead protection education?	NO	Educate residents on how <u>they</u> can protect drinking water.

Conclusions

Source protection recommendations are listed in Table 3, the Key Issues above and Appendix A. These recommendations are only part of your ongoing local drinking water source protection.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/nfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendix

- A. Source Protection Fact Sheets - *Water Suppliers Protect Drinking Water, Residents Protect Drinking Water*



Source Water Assessment Program (SWAP) Report For Wellfleet Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 14, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Wellfleet Elementary School
PWS Address	100 Lawrence Road
City/Town	Wellfleet, Massachusetts
PWS ID Number	4318037
Local Contact	Harvey Smith
Phone Number	508-349-1377

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4318037-01G	235	567	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Wellfleet Elementary School is a public water supply currently serving the 240 students and staff. Well #1 is a 5-inch sand and gravel well drilled to a depth of 116 feet. Well #1 received final source approval by the Department in a letter dated September 24, 1991 for 7500 gallons per day. Based upon the 7500 gallons per day withdrawal limit, the Zone I is 235 feet and Interim Wellhead Protection Area (IWPA) is 567 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map of the

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Zone I and IWPA.

The well serving the facility is treated with calcium carbonate (calcite) filtration system for corrosion control. The filtration system is utilized to adjust the pH of the water to reduce its corrosiveness. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate activities within the Zone I,**
2. **Athletic Fields,**
3. **Septic System,**
4. **Storm Water,**
5. **Storage, Use, and Handling of Hazardous Materials/Oil.**

The overall ranking of susceptibility to contamination for the well is **Moderate**, based on the presence of at least one **Moderate** threat land use or activity in the IWPA, as seen in Table 2.

1. Zone I– Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains baseball athletic fields. Currently, the well does meet the Department requirements that the public water supplier own or control all land encompassed by the Zone I. Please note that systems not meeting Department Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. The Department's site assessment visit revealed that the wellhead terminates approximately 12 inches above ground surface.

Recommendations:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Prohibit public access to the well by providing a means to secure the wellhead (i.e. fence or locked structure).
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the attachments
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Fields	Well #1	Well #1	Moderate	Do not use pesticides or fertilizers in Zone I
Storage, use and handling of oil and hazardous materials	No	Well #1	Moderate	Lawn mower, gas cans, and small amounts of chemical storage
Floor drain	No	No	-	Backwash for water treatment
Underground Storage Tanks	No	No	-	1-10,000 gallon heating oil fiberglass, 1-500 gallon steel tank for backup generator

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ Look for illegal dumping and evidence of vandalism.

2. **Athletic Fields** - There are playing fields located within the Zone I and IWPA of Well #1. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply.

Recommendations:

- ✓ Do not apply fertilizer and pesticides within the Zone I.
- ✓ Use BMPs for applying, handling and storing of pesticides and fertilizers in the IWPA.
- ✓ Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

3. **Septic Systems** - The septic system leaching field for the elder services building is located 237 feet south of Well #1. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals or industrial wastewater to the septic system is a potential source of contamination to the water supply.

Recommendations:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
- ✓ Educate staff on septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Workers should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at the Mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>

4. **Storm water** – The Wellfleet Elementary School paved parking areas and Lawrence road are located West of the Zone I for Well #1. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Catch basins transport storm water from the roadway and adjacent properties to the ground.

Recommendations :

- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ The Department recommends the public water supplier consider nonstructural

techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff. Additionally, the public water supplier may want to consider structural BMPs (e.g. stormwater swales, installation of curbs along the paved areas, detention basin, etc.) as part of a comprehensive storm water management plan for the site. To learn more refer to the *Storm Water Management Handbook, Volume 1 and 2* for information on BMPs and documents available at <http://www.state.ma.us/dep/brp/www/pubs.htm>.

5. **Storage, Use, and Handling of Hazardous Materials/Oil:** If managed improperly, school cleaning supplies and other household hazardous materials can all contribute to groundwater contamination. Hazardous materials may include automotive products, household cleaners, paints, solvents, pesticides, and other substances. The materials within the schools janitor's closets pose a potential threat to the well due to their proximity and potential for accidental release.

Recommendation:

- ✓ Implement standard operating procedures regarding proper

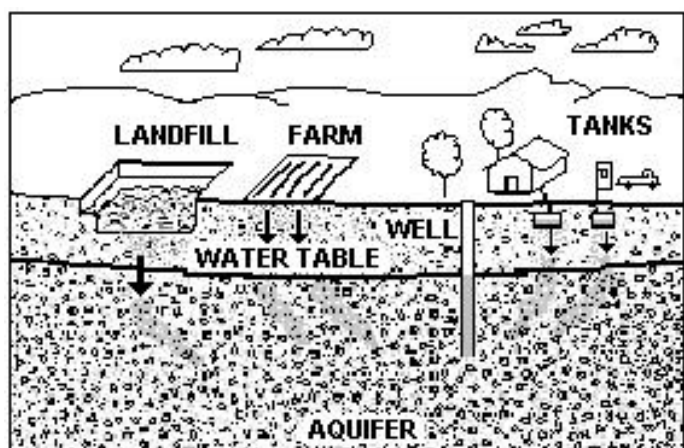


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

storage, use and disposal of hazardous materials.

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ To learn more, refer to the hazardous materials guidance documents at www.state.ma.us/dep/bwp/dhm/dhmpubs.htm and the household hazardous waste documents available at <http://www.state.ma.us/dep/recycle/hazards/hhwhdome.htm>

Other activities noted during the assessment:

A 10,000 gallons heating oil UST and 500 gallon steel diesel tank for the backup generator are located approximately 600 feet Southwest of Well #1. The 10,000-gallon tank was installed in 1992 and is fiberglass, double walled with an alarm system according to school staff. An UST is a concern due to the potential threat posed by the release of its contents if managed improperly. Consult with the local fire department for any additional local code requirements regarding UST's. Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Upgrade to propane or natural gas for back-up power sources.

The school's septic system is not located within the IWPA of the well (approximately 600 feet Southwest of the well). However, if the septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply. Staff should be instructed in the proper disposal of spent household chemicals (Include custodial staff, groundskeeper and certified operator). Septic system components should be located, inspected and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

A dry well that receives backwash from the corrosion control water treatment system is regulated under the Underground Injection Control (UIC). Register the dry well through the Underground Injection Control (UIC) program (BRP WS 06 permit application). Contact the UIC coordinator for the Southeast Region Office of the Department if you require additional technical assistance (Mark Dakers Tele. #508-946-2847).

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. A drinking water protection sign was posted within the IWPA. Wellfleet Elementary School should review and adopt the **key recommendations above** and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.

- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- ✓ Work with local officials in Wellfleet to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Healthy Schools Fact Sheet
- UIC Registration Package
- Industrial Floor Drains Brochure
- Wellhead Protection Grant Program Fact Sheet
- Pesticide and Fertilizer Use Fact sheets



Source Water Assessment Program (SWAP) Report For Harborside Village

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 23, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Harborside Village
PWS Address	P.O. Box 715
City/Town	Wellfleet, Massachusetts
PWS ID Number	4318040
Local Contact	Ray Steele
Phone Number	508 384-7446

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4318040-01G	230	797	High
Well #2	4318040-01G	230	797	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Harborside Village (formerly Schuster's Trailer Park) is a privately owned trailer park consisting of 85-trailer sites and two (2) residential homes. Harborside Village is served by two (2) wells located in the northern portion of the property. Well #1 is a two-inch well located below grade and drilled to a depth of 65 feet. Well #2 extends 12 inches above grade and is drilled to a depth of 67 feet. The system is equipped with a propane fueled emergency power generator. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration.

Well #1 was approved by the Department in a letter dated November 28, 1989 after completing the new source approval process. The average daily withdrawal for the wells

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

is limited to 17,880 gallons per day, based on the current Zone I of 230 feet and Interim Wellhead Protection Area (IWPA) of 797 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the public water system contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Aboveground Storage Tanks (AST) With Heating Oil.**
3. **Septic System,**
4. **Lawn Care and Maintenance**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

Zone Is – Currently, both wells fail to meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Zone Is for well #1 and well #2 contain aboveground storage tanks, trailers, homes, roads, landscaped areas and parking areas. The Department observed that several aboveground storage tanks located in the Zone I had containment structures, but they appeared to not be impermeable or the containment volume was less than 110 percent.

An estimated 50 gallons of #2 fuel oil leaked from an AST located adjacent to the residential trailer impacting the surrounding soil approximately 150 feet from well #1 and well #2. The MA DEP was notified of this condition in accordance with Chapter 21E of the Massachusetts General Laws on April 3, 1999 and released tracking No. RTN 4-14694 was assigned. A response action outcome (RAO) class A-2, completion statement was received by the Department on May 4, 2000. The filing of a response action outcome indicates that a ... "level of No Significant Risk of harm to health, public welfare and the

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Aboveground Storage Tank	Well #1, #2	Well #1, #2	High	AST in-home north of wells
Parking, driveways & roads	Well #1, #2	Well #1, #2	Moderate	Limit road salt usage and provide drainage away from wells
Residential	Well #1, #2	Well #1, #2	Moderate	AST, Lawn care, gardening, septic systems, household hazardous waste
Septic System	No	Well #1, #2	Moderate	Refer to septic system brochure in the attachments
Storm water	Well #1, #2	Well #1, #2	Low	
Structures	Well #1, #2	Well #1, #2	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please refer to the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

environment has been achieved at this site" (Response Action Outcome Statement for RTN 4-14694, May 3, 2000). The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

The public water supplier does not own and/or control all land encompassed by the Zone I. The Northeast portion of the trailer site is not owned by Harborside Village. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. The definition of "expand" is any activity that would result in an increase in withdrawal from existing sources. Examples are: 1. addition of a service connection for new or existing living units, 2. the addition of a bedroom or bedrooms to living units that are connected to your system.

Recommendations:

- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Inventory all ASTs in the Zone I as to whether the tanks have external 110 percent secondary containment (vaulted) or internal secondary containment (tank within the tank) and are sealed to be impermeable (refer to attachments).
- ✓ For existing aboveground storage tanks in Zone I without secondary containment, the Department recommends that you consider the following options:
 - A. If feasible convert to propane/natural gas, or
 - B. If option "A." is not chosen you are required to provide a 110% percent secondary containment for all aboveground storage tanks within the 230 feet Zone I. The Department's November 28, 1989 pump test approval letter required all liquid fossil fuel storage facilities which are located within the Zone I be placed in an aboveground vaulted containment structure (as depicted on drawing No. SK-2) and be adequately enclosed (covered) to prevent standing water, snow, ice within the containment structures. The plan SK-2 specifies that all AST secondary containment structures are to be sealed as to be impermeable to oil for all fossil fuel tanks in the Zone I.
- ✓ Do not exceed the average daily withdrawal limit for this public water system of 17,880 gallons per day.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ For more information about the state's oil and/or hazardous material (OHM) site cleanup process to which the reference site was subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site - specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm> or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

2. **Aboveground Storage Tank (AST) in IWPA** – In addition to the tanks in the Zone I, there were numerous tanks within the IWPA that did not have secondary

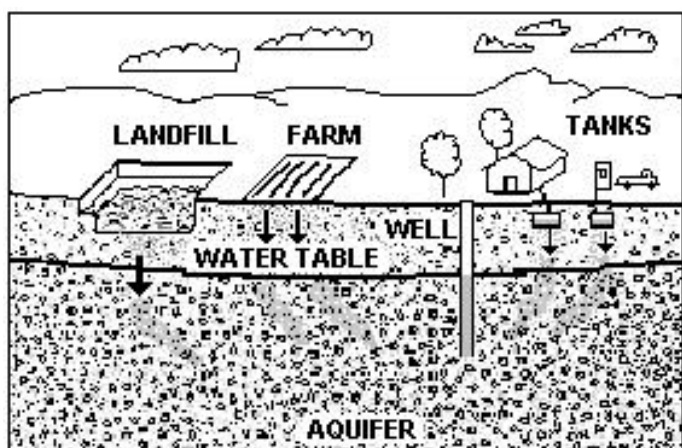


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

containment. If managed improperly, Aboveground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendations:

- ✓ If you have an existing aboveground storage Tank in IWPA without secondary containment no modification is required by the drinking water program for the tank if it is in compliance with all other state and local requirements. However, the drinking water program recommends 110% secondary containment for all aboveground storage tanks in Wellhead protection areas.
- ✓ The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks.
- ✓ Make sure AST legs are on a firm base and are protected from vehicles.
- ✓ Encourage residents to convert to propane or natural gas or provide secondary containment for all tanks within the IWPA (refer to attachments).
- ✓ Work with the local fire Department to ensure compliance with local code requirements regarding ASTs.
- ✓ During refilling of AST, ensure that the operator of the oil transport tanker does not leave the vehicle area while the AST is being filled.

3. **Septic Systems** - On Jan. 30, 1998 the Department issued a groundwater discharge permit SE #0-640 for Schuster's Trailer Park. The groundwater discharge permit was for a proposed wastewater treatment facility for the trailer park. The wastewater facility was designed to treat a maximum of 21,600 gallons per day sanitary sewerage by means of an Amphidrome treatment system. The wastewater treatment system is designed to remove nutrients and disinfect wastewater prior to discharge to subsurface leaching area. The wastewater treatment facility has not been constructed. Harborside Village will be required to initiate construction of the plant in the near future.

Currently, septic systems are located within the IWPA of both wells. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply.

Recommendations:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
- ✓ Educate residents on private septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>

4. **Lawn Care and Maintenance** – Over-application of pesticides and fertilizers on lawns is a potential source of contamination to the water supply.

Recommendation:

- ✓ Provide educational materials to residents about the proper application of pesticides or fertilizers. Refer to attachments, A Homeowner Guide to Environmentally Sound Lawn Care and Pesticide and Fertilizer fact sheets. Additional information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's web site at <http://www.massdfa.org>.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Drinking water protection area signs were not posted at key locations at the time of the SWAP site visit. Harborside Village should review and adopt the **key recommendations** above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, and evidence of vandalism.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

Training and Education:

- ✓ Drinking water protection signs were not observed during the SWAP site visit. Post drinking water protection area signs at key visibility locations.
- ✓ Educate residents on proper application of pesticides and fertilizers.
- ✓ As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in Wellfleet to include Harborside Village's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Heating Oil Delivery Lines, A Homeowner's Guide to Preventing Leaks
- A Homeowner's Guide to Avoiding Costly Heating Oil System Leaks
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Fertilizer Use Fact sheet
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet
- A Homeowners Guide to Environmentally Sound Lawn Care



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Wellfleet Harbor Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
February 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Wellfleet Harbor Condominiums
PWS Address	205 Commercial Street
City/Town	Wellfleet
PWS ID Number	4318043
Local Contact	Nancy Bonvissuto/Russell Tierney
Phone Number	(845) 878-4858/(888) 377-7678

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	158	478	High
Well #2	02G	158	478	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for the Wellfleet Harbor Condominiums are located to the west of the facility adjacent to Commercial Street. The wells have Zone Is of 158 feet and an Interim Wellhead Protection Areas (IWPA) of 478 feet. An IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPA.

The wells serving the facility have no treatment at this time. The DEP requires public

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **boat yard;**
3. **septic systems;**
4. **residential development; and**
5. **vehicle parking and roads.**

The overall ranking of susceptibility to contamination for the well is high, based on the presence of a high ranked threat within the IWPA.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I contains residential uses including septic system components, vehicle parking, roads and the public water supplier does not own or control all the land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Never dispose of hazardous materials down drains leading to septic systems.
- ✓ Educate septic system users on proper operation and maintenance of septic systems.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Direct stormwater drainage away from Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Boat Yard	No	Yes	High	Fuels, paints, solvents & other hazardous materials
Vehicle parking and Roads	Yes	Yes	Moderate	stormwater runoff, leaks and spills
Lawns	Yes	Yes	Moderate	fertilizer and pesticide use
Septic systems	Yes	Yes	Moderate	bacteria, improper disposal of hazardous materials
Residential development	Yes	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Boat Yard** – A boat yard located to the west of the facility lies within the IWPA. If handled improperly leaks and spills of hazardous materials used in their daily activities can potentially contaminate the water supply.

Recommendations:

- ✓ Educate the neighboring boat yard about the location of the wells and IWPA.
- ✓ Encourage the use of BMP's for the storage, handling, and disposal of all hazardous materials and wastes.
- ✓ If the boat yard has floor drains, ensure that the floor drains lead to a tight tank or municipal sewer as required by the plumbing code and Underground Injection Control Regulations, 310 CMR 27.00.

3. **Septic Systems** – Septic systems are located within the IWPA.

Recommendation:

- ✓ Educate residents and neighbors about the dangers of potential groundwater contamination from improper use of or poor maintenance of septic systems
- ✓ Septic system components should be located, inspected and maintained on a regular basis.

4. **Residential Development** – There is medium density residential development within the IWPA.

Recommendation:

- ✓ If possible, contact residents in the IWPA about water supply protection. A brochure is included in this packet.

5. **Vehicle Parking and Roads** – Residential and commercial parking of vehicles is common throughout the IWPA. Local roads are present within the IWPA. Runoff and spills from parking and roads can contaminate public wells.

Recommendation:

- ✓ Ensure stormwater drainage is directed away from the wellhead.
- ✓ Maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

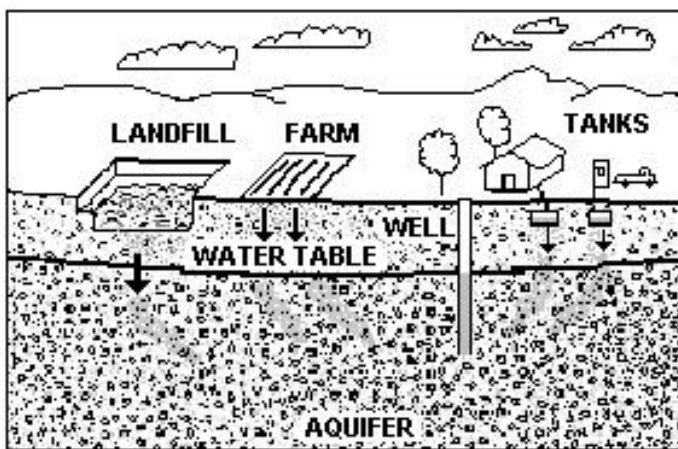


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Wellfleet Harbor Condominiums should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone Is.
- ✓ Remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Continue regular inspections of the Zone Is. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

the Zone Is at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Educate boat yard owners on drinking water source protection issues; be sure to include proper hazardous material use, disposal, emergency response, and best management practices.
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

6. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Massasoit Hills Trailers

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May 5, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Massasoit Hills Trailers
PWS Address	West Road
City/Town	Wellfleet, Massachusetts
PWS ID Number	4318056
Local Contact	Dawn Packington
Phone Number	(508) 349-2469

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4318056-01G	353	1487	Moderate
Well #2	4318056-02G	353	1487	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for the Massasoit Hills Trailers are located to the west of the residences. Both wells have a Zone I of 353 feet and an Interim Wellhead Protection Area (IWPA) of 1487 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The wells serving the facility receive no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Aboveground Storage of Heating Oil;**
3. **Septic Systems; and**
4. **Stormwater Catchbasin.**

The overall ranking of susceptibility to contamination for the wells is moderate, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The Massasoit Hills Trailers Zone I contain residences, roads, and parking areas. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ As feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ If the Massasoit Hills Trailers intend to continue using the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
2. **Aboveground Storage of Fuel Oil** – There is fuel oil stored at residences within the Zone I and IWPA in Aboveground Storage Tanks (AST). If managed improperly, AST can be a potential source contamination due to leaks or spills of the chemicals

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Nursery and Landscaping	No	Both	Moderate	Fertilizer and pesticide use
Parking, driveways & roads	Both	Both	Moderate	Limit road salt usage and provide drainage away from wells
Septic Systems	No	Both	Moderate	See septic systems brochure in the appendix
Fuel Storage Above Ground	Both	Both	Moderate	Should be on impervious surface
Stormwater Drains / Retention Basins	Both	Both	Moderate	Runoff from roadways
Structures	Both	Both	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

they store. It is unknown whether any of the residences had storage of fuel oil in an underground storage tank (UST) in the past.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Investigate any remaining undocumented UST within the IWPA to be removed or replaces as needed.

3. **Septic systems** - Septic systems are located within the IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Residents should be instructed on the proper disposal of spent household chemicals.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

4. **Storm Water Catch Basin** – There are catchbasins for storm water withing the IWPA. Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

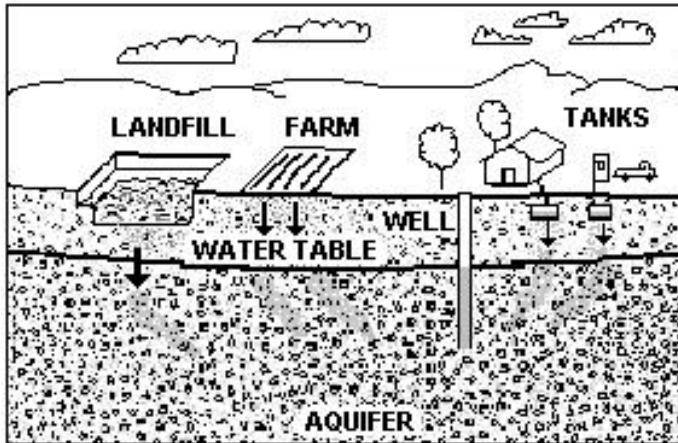


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Massasoit Hills Trailers is commended for removing septic systems from the Zone I and taking an active role in source protection. Massasoit Hills Trailers should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep new non-water supply activities out of the Zone I.
- ✓ As feasible remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

locking facilities, gating roads, and posting signs.

- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Upgrade to propane or natural gas for back-up power sources.

Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Pleasant Water Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May 9, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Pleasant Water Company
PWS Address	PO Box 993
City/Town	Wellfleet, Massachusetts
PWS ID Number	4318091
Local Contact	William Corcoran
Phone Number	(508) 349-2061

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4318091-01G	296	855	High
Well #2	4318091-02G	296	855	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The two wells for Pleasant Point are located near the tip of Pleasant Point. Well #1 and Well #2 each have a Zone I protective radius of 296 feet and an Interim Wellhead Protection Area (IWPA) of 855 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the wells may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPAs.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The wells serving the community have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Residential Septic Systems;**
3. **Residential Storage of Heating Oil; and**
4. **Stormwater Catchbasin.**

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I** – Currently, the wells do not meet DEP's restrictions, which only allow water supply related activities in Zone I. The system's Zone I contain residential homes with septic systems, local roads, and a stormwater catchbasin. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Where possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Use BMPs and restrict activities that could pose a threat to the water supply from the residences and roads within the Zone I.
- ✓ Relocate the stormwater basin closest to the wells and redirect stormwater drainage away from the wells and the Zone I where possible.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic Systems	Yes	Yes	High	Several septic systems in Zone I. See septic systems brochure in the appendix
Fuel Oil Storage at residences	Yes	Yes	Moderate	Heating oil tanks
Parking lot, driveways & roads	Yes	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Stormwater Drains / Retention Basin	Yes	Yes	Low	Close to wellhead – direct away from wells.
Fishing/Boating and Aquatic Wildlife	Yes	Yes	Low	
Structures	Yes	Yes	-	Non-water supply residences in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Septic systems** – Numerous septic systems are located within the Zone I and IWPA of the wells. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Educate residents on the proper disposal of spent household chemicals.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Instruct residents to avoid septic tank cleaners, especially those with acids and solvents.

3. **Residential Storage of Heating Oil** – There is storage of heating oil at residences within the Zone I and IWPA. If managed improperly, Aboveground and Underground Storage Tanks (AST and UST) can be a potential source contamination due to leaks or spills of the chemicals they store.

Recommendations:

- ✓ Aboveground storage tanks in your IWPA should be located on an impermeable surface, and also contained in an area large enough to hold the complete liquid volume, should a spill occur.
- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices. Any modifications to the UST and AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding ASTs.
- ✓ Encourage the use of propane or natural gas as heating fuel, especially within the Zone I. Because these gasses volatilize to the air, they are unlikely to be a potential source of contamination to groundwater.

4. **Storm Water Catch Basin** – There is a stormwater catchbasin close to the wells within the Zone I. Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- ✓ Relocate the stormwater basin closest to the wells and redirect stormwater drainage away from the wells and the Zone I where possible.
- ✓ Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Pleasant Point Water should review and adopt the key recommendations above and the following:

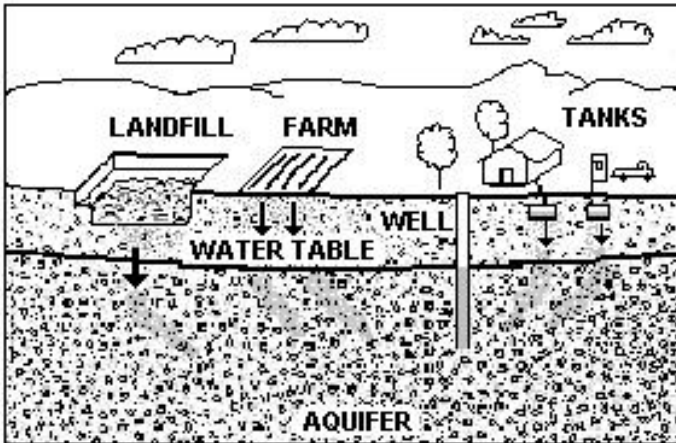


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Priority Recommendation:

- ✓ Relocate the stormwater basin closest to the wells and redirect stormwater drainage away from the wells and the Zone I where possible.

Zone I:

- ✓ Keep new non-water supply activities out of the Zone I.
- ✓ Where possible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well and pumphouse by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Upgrade all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Encourage Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on IWPA properties.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glpgrgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Cole's Neck Water Supply

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 21, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Cole's Neck Water Supply
PWS Address	220 West Main Street
City/Town	Wellfleet, Massachusetts
PWS ID Number	4318094
Local Contact	Mark Vincent
Phone Number	508 349-0315

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4318094-01G	230	844	Moderate
Well #2	4318094-02G	230	844	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Cole's Neck Water Supply system is a community public water supply serving 31 homes and the towns transfer station. Well #1 and Well #2 are 8-inch sand and gravel wells drilled to a depth of 147 feet and 145 feet, respectively. Well #1 and Well #2 received final source approval by the Department in a letter dated August 24, 1988 for 20,000 gallons per day. Based upon the 20,000 gallons per day withdrawal limit, the Zone I is 230 feet and Interim Wellhead Protection Area (IWPA) is 844 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The Cole's Neck public water supply was constructed in order to provide safe supply of drinking water for up to fifty (50) residents where private wells had been contaminated or threatened by a municipal landfill plume.

The public water system is currently in the process obtaining approval to treat the wells water with calcium carbonate (calcite) contactor system for corrosion control. The contactor system is to be utilized to adjust the pH of the water to reduce its corrosiveness. For current information on monitoring results and treatment or for a copy of the most recent Consumer Confidence Report, please contact the Public Water System person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Lack of ownership of Zone I,**
2. **Residential,**
3. **Storm Water, and**
4. **Storage, Use and Handling of Diesel Fuel.**

The overall ranking of susceptibility to contamination for the well is **Moderate**, based on the presence of at least one **Moderate** threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I**– Currently, the well meets DEP's requirements that only allow water supply related activities in Zone Is. The facility's Zone I is entirely comprised of woodlands. Currently, the well does not meet the Department requirements that the public water supplier own or control all land encompassed by the Zone I. The Department records indicate that the town only owns 80 feet of the 230 feet of land north of the well. The rest of the Zone I land north of the well is owned by the National Seashore. It is unlikely that future development would occur in an area under the control of the National Park Service. Please note that systems not meeting Department Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Access to the wells is restricted

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System	No	Well #1, #2	Moderate	Refer to septic systems brochure in the attachments
Driveways and roads	No	Well #1, #2	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Well #1, #2	Moderate	Septic systems, fuel storage, fertilizer and pesticide use
Storage, use and handling of diesel fuel	Well #1, #2	Well #1, #2	Moderate	Diesel Generator, transformer

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

by a gated access road and a fenced enclosure.

Recommendations:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Ensure that the National Park Service is aware of the Zone I boundary.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Conduct regular inspections of the Zone I and IWPA.
- ✓ Look for illegal dumping and evidence of vandalism.

2. **Residential Land Use** - If managed improperly, household hazardous waste, septic systems, lawn care, and pet waste can all contribute to groundwater contamination. Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. The septic system leaching fields for residential homes are located just beyond the Zone I of 230 feet (South and Southwest of wells). If a septic system fails or is not properly maintained, it could be a potential source of microbial contamination. Fertilizers and pesticides contain hazardous chemicals that can travel through the soil and contaminate ground water if over-applied. Pet waste may contain bacteria, parasites, or viruses that are a health risk. Water supplies may also be threatened from improper use and disposal of chemical products used in homes or businesses. Educating residents and businesses on proper disposal of these materials is the best defense against pollution.

Recommendations:

- ✓ Proper Household Hazardous Waste Disposal - Residents should dispose of used oil, antifreeze, paints, and other household chemicals properly - not in septic systems. Encourage residents to participate in Household Hazardous Waste Collection days or centers. Educate residents on septic systems about proper disposal practices. Refer to <http://www.state.ma.us/dep/brp/files/yoursyst.htm> for additional information. .
- ✓ Septic System Care - Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ Underground and Aboveground Storage Tanks— Encourage residents to upgrade fuel oil storage tanks to incorporate proper containment and safety practices. Any modifications must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements.
- ✓ Environmentally Sound Lawn Care - Provide educational materials to residents about the proper application of pesticides or fertilizers. Information on environmentally sound lawn care practices is available from the Massachusetts

Department of Food and Agriculture Pesticide Bureau's at <http://www.massdfa.org>.

3. **Storm water** – Local roads are located within the IWPA for Well #1 and #2. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Catch basins transport storm water from the roadway and adjacent properties to the ground.

Recommendations:

- ✓ Have the catch basins within the IWPA inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm water runoff.
- ✓ To learn more refer to the *Storm Water Management Handbook, Volume 1 and 2* for information on BMPs and documents available at <http://www.state>.

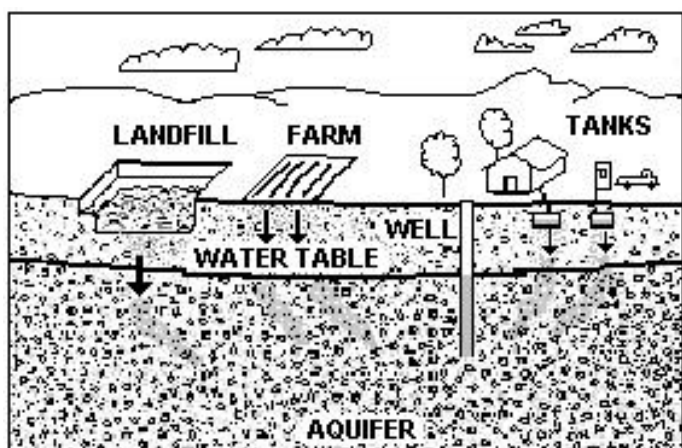


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

ma.us/dep/brp/ww/wwpubs.htm.

4. **Storage, Use and Handling of Diesel Fuel** - A diesel generator, which can run the well pumps in case of a commercial power outage, is located within the Zone I of both wells. The generator has a small fuel tank that must be filled prior to running the generator.

Recommendations:

- ✓ Do not store fuel cans in your Zone I.
- ✓ Upgrade all fuel storage tanks to incorporate proper containment and safety practices. Consult with the local fire department for any additional local code requirements regarding fuel storage.
- ✓ Upgrade to propane or natural gas for backup power sources.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Drinking water protection signs were posted within the IWPA. The town has sent public education material regarding protection of drinking water supplies to all residents served by the Cole's Neck public water supply. Cole's Neck Water Supply should review and adopt the **key recommendations above** and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ A transformer is located within the Zone I. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Training and Education:

- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.

Planning:

- ✓ Work with local officials in Wellfleet to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.

- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding

opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Wellhead Protection Grant Program Fact Sheet
- Pesticide and Fertilizer Use Fact sheets
- One Day Hazardous Waste Collections Fact Sheet



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
WEST BRIDGEWATER WATER DEPARTMENT

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	West Bridgewater Water Department
<i>PWS Address</i>	29 Cyr Street
<i>City/Town</i>	West Bridgewater, MA 02379
<i>PWS ID Number</i>	4322000
<i>Local Contact</i>	Richard E. Krugger, Superintendent
<i>Phone Number</i>	(508) 894-1271

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

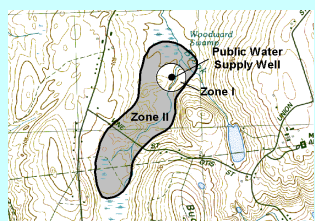
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA: is the larger area that is likely to contribute water to the well. In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Section 1: Description of the Water System

<i>Zone II #67</i> <i>Susceptibility: High</i>	
<i>Well Name</i>	<i>Source IDs</i>
Cyr Street #1 GP	4322000-01G
Norman Avenue #2 GP	4322000-02G
#5 GP	4322000-05G
<i>Zone II #322:</i> <i>Susceptibility: High</i>	
<i>Well Name</i>	<i>Source IDs</i>
Manley Street Wellfield (inactive)	4322000-03G
<i>Interim Wellhead Protection Area (IWPA) Susceptibility: High</i>	
Cyr Street #4 GP	4322000-04G

The West Bridgewater Water Department has four active wells and one inactive well listed above. Each well has a Zone I of 400 feet. All the wells except 04G have a Zone II that has been hydrogeologically determined. Well #04G has an Interim Wellhead Protection Area (IWPA). These terms are defined in the Glossary. The wells are located in the Taunton River basin. They have a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map for the Zone II boundaries.

For current information on treatment and the results of water quality monitoring, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safe-water/ccr1.html>.

Section 2: Land Uses in the Protection Areas

Zone II #67 and the IWPA are located in West Bridgewater with a small section of each extending into Brockton. Zone II #322 is located in West Bridgewater, Easton and Brockton. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Land Uses Within Zone I
2. Residential Land Uses
3. Automobile Repair Shops/Service Stations/Body Shops
4. Gas Stations
5. Transportation Corridors
6. Oil or Hazardous Material Release Sites
7. Dairy Farm
8. Car Wash
9. Cemeteries
10. Bus/Truck Terminals
11. Utility Substation/Transformers
12. Transmission Lines
13. Railroad Tracks/Yards
14. Industry/Industrial Park
15. Nursing Homes
16. Small & Very Small Quantity Hazardous Waste Generators
17. Underground & Above ground Storage Tanks

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Land Uses Within Zone I – The Zone I for each of the wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The West Bridgewater Water Department owns or controls all the Zone Is and there are no non-water supply activities occurring. The Water District conducts regular inspections of the Zone Is.

Zone I Recommendations:

- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 32% and 10% of Zone IIs #67 and #322, respectively, consist of residential land uses. The IWPA contains 26% residential land uses. The Zone IIs also contain 59%, 27% and 64%, respectively, forested, undeveloped land. A large portion of this forested land has the potential for more residential development. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed

improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

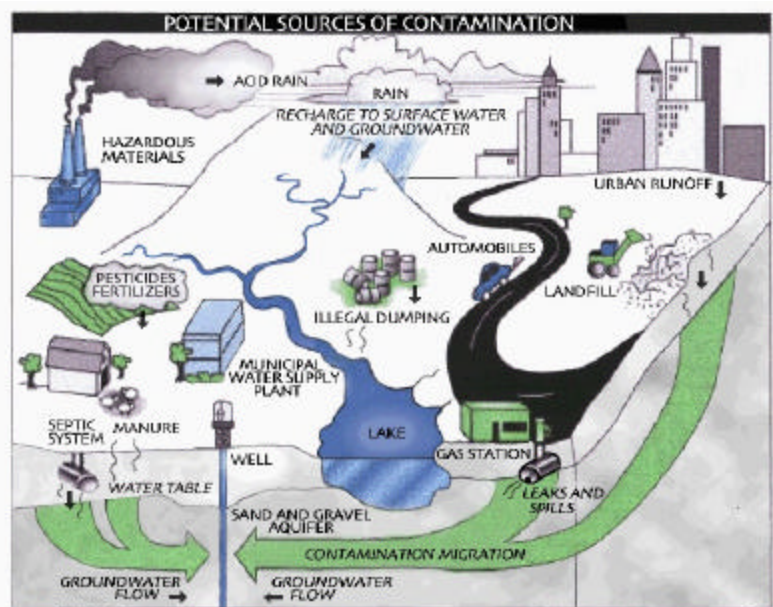
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



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Residential Land Use Recommendations:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Continue to work with officials in West Bridgewater, Easton and Brockton to control new residential development in the water supply protection areas. See www.state.ma.us/envir/ to obtain information from the Massachusetts Executive Office of Environmental Affairs on build-out analyses for West Bridgewater.
- ✓ Promote Best Management Practices (BMPs) for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at <http://www.state.ma.us/dep/brp/wm/nonpoint.htm>.
- ✓ Encourage the Town of West Bridgewater to conduct household hazardous waste collection days.

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

3. Automobile Repair Shops/Body Shops - There is one automobile repair shop within Zone II #331. Automotive fluids and solvents can leak or spill from this type of facility.

Auto. Repair Shop/Body Shop Recommendation:

- ✓ Talk with the owner/operator about the water supply protection area and discuss the importance of proper handling, storage and disposal of fluids and solvents.

4. Gas Stations - There are gas stations within the Zone IIs. A local bylaw prohibits future gas stations.

Gas Station Recommendation:

- ✓ Talk with the owners/operators about the water supply protection area and discuss the importance of proper handling, storage and disposal of fluids, solvents and fuel.

5. Transportation Corridors -

Route 24 runs through Zone II #322 and Route 28 runs through Zone II #67.

For More Information

Contact Isabel Collins in DEP’s Lakeville office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Local roads are located in both Zone IIs and the IWPA. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage systems along transportation corridors. Wherever possible, ensure that drains discharge to outside the Zones II and IWPA.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills can be effectively

(Continued on page 7)

Source Protection Decreases Risk

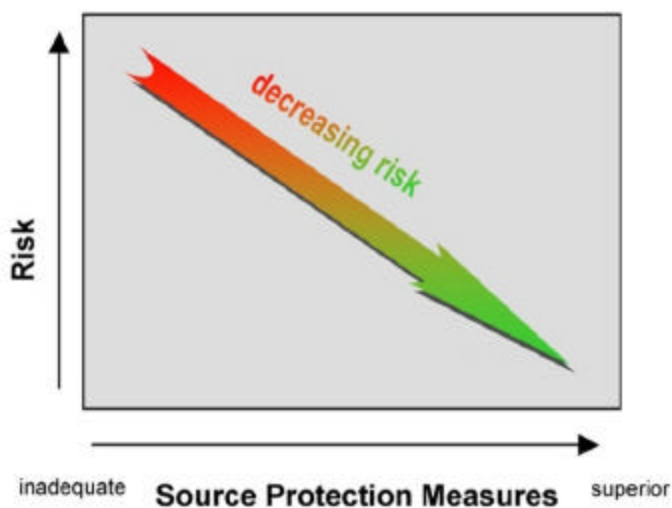


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II, IWPA)

Activities	Quantity	Threat*	Potential Source of Contamination
Residential (Zone IIs 67 and 322 and the IWPA)			
Septic Systems	many	M	microbial contaminants, improper disposal of hazardous chemicals
Fuel Oil Storage	many	M	spills, leaks or improper handling of fuel oil
Lawn Care	many	M	over-application of improper storage and disposal of pesticides
Commercial			
Automotive Repair Shops/ Body Shops	67, 322	H	leaks or spills of automotive fluids and solvents
Gas Stations	67, 322	H	leaks or spills of automotive fluids, solvents and fuels
Cemeteries	1 in 67, 2 in 322	M	leaks or spills from pesticide & fertilizer use; historic embalming fluids
Bus & Truck Terminals	2 in 322	H	leaks or spills from fuels & maintenance chemicals
Nursing Homes	322	L	microbial contaminants from septic system
Car Wash	1 in 67 (hooked into Brockton sewer system)	L	wash water, soaps, oils, grease, metals, salts; inappropriate disposal of trash by customers
Railroad Tracks & Yards	67; 322, IWPA (inactive)	H	over-application or spills of pesticides on the rights-of-way; spills from railroad cars or railroad maintenance chemicals
Industrial			
Industry, Industrial Park	several industries in 322	H	leaks or spills of chemicals and metals
Agricultural			
Dairy Farm	1 in 322	M	microbial contaminants from improper handling or disposal of manure; grazing animals too close to streams

Miscellaneous			
Small & Very Small Quantity Hazardous Waste Generators	see Appendix B	M & L	leaks or spills of hazardous materials or wastes
Utility Substation/Transformers	67 (Spring St.)	L	leaks or spills of chemicals and other materials, including PCBs
Transportation Corridors	numerous - all	M	leaks or spills of fuel, other hazardous materials or pesticides
Transmission Line Rights-of-Way	322, IWPA	L	leaks or spills due to over-application or improper handling of corridor maintenance pesticides; construction
Underground Storage Tank/Above Ground Storage Tank	67, 322	H & M	leaks or spills of stored materials
DEP Tier Classified Oil or Hazardous Material Release Sites	67, 322	not ranked	see Appendix C for more information

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

contained.

- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Check with the local Conservation Commission to determine whether pesticides are used on the railroad beds. The railroad utility is responsible for submitting a copy of their approved Vegetation Management Plan and Yearly Operating Plan to the Town if pesticides are used in the right-of-way. There are state regulatory setbacks and other requirements to help protect drinking water sources from pesticide over-application or spills.

6. Oil or Hazardous Material Release Sites – DEP Tier Classified Oil or Hazardous Material Release Sites are located within Zone II #322. Refer to the accompanying GIS map and Appendix C for more information.

Oil/Hazardous Materials Recommendations:

- ✓ Monitor the status of the sites.
- ✓ Distribute the fact sheet *Businesses Protect Drinking Water* available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm.

7. Dairy Farm - A dairy farm is located within Zone II #322. Microbial contamination could result from improper handling, use or storage of manure. Runoff of manure could occur where soils are not stabilized enough to act as a filter to pollution during precipitation events.

Dairy Farm Recommendations:

- ✓ Encourage the proper handling and storage of manure.
- ✓ Encourage the establishment of vegetated buffers to control runoff and erosion.

8. Car Wash - There is a car wash within Zone II #67.

Car Wash Recommendation:

- ✓ Encourage the proper management of wash water at the facility

9. Cemeteries - There are cemeteries within both Zone IIs.

Cemetery Recommendation:

- ✓ Encourage the proper use, handling and storage of pesticides and fertilizers.

10. Bus/Truck Terminals - There are two bus and/or truck terminals within Zone II #322.

Bus/Truck Terminal Recommendations:

- ✓ Encourage the use of BMPs for the storage, handling and disposal of fuels and maintenance chemicals.
- ✓ Encourage spill prevention measures.

11. Utility Substation/Transformers - There is a utility substation transformer located in each Zone II.

Transformer Recommendation:

- ✓ Encourage BMPs for chemical handling and disposal.

12. Transmission Lines - There is a transmission line within Zone II #322.

Transmission Lines Recommendation:

- ✓ Contact the Conservation Commission to review the Utility's Yearly Operating Plan (YOP) for pesticide applications.

**Top 5 Reasons to
Develop a Local Wellhead
Protection Plan**

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- ♦ Increased groundwater monitoring and treatment
- ♦ Water supply clean up and remediation
- ♦ Replacing a water supply
- ♦ Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES	Continue monitoring activities in Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	NO	Adopt local wellhead protection controls, through a bylaw or Board of Health regulation, that meet 310 CMR 22.21 (2).
Do neighboring communities protect the Zone II areas extending into their communities?	YES - Easton	Continue to work with Easton and Brockton regarding wellhead protection.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow <i>Developing a Local Wellhead Protection Plan</i> available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal <i>Emergency Response Plan</i> to deal with spills or other emergencies?	YES	Work with the Town’s Local Emergency Planning Committee to conduct drills with local emergency response officials to test procedures.
Does the municipality have a wellhead protection committee?	NO	A committee can be helpful with implementing wellhead protection measures.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Continue to coordinate efforts with town officials.
Does the PWS provide wellhead protection education?	YES	Educate residents on how <u>they</u> can protect drinking water.

13. Railroad Tracks & Yards - There are railroad tracks and/or yards located within both Zone IIs and within the IWPA.

Railroad Recommendations:

- ✓ See the Conservation Commission for information on pesticide use on the railroad rights-of-way.
- ✓ Ask the railroads to notify you in the event of a spill.

14. Industry/Industrial Park - There are industrial facilities and an industrial park within Zone II #322.

Industrial Recommendation:

- ✓ Encourage BMPs for handling, storage and disposal of chemicals and metals.

15. Nursing Homes - There are nursing homes within Zone II #322.

Nursing Home Recommendation:

- ✓ Encourage the proper maintenance of septic systems.

16. Small and Very Small Quantity Generators of Hazardous Waste (SQGHW & VSQGHW) - These facilities are located within both Zone IIs.

S/VSQGHW Recommendation:

- ✓ Talk with the owner/operator about good handling and disposal practices.

17. Above Ground and Underground Storage Tanks (AST/UST) - These tanks are located within both Zone IIs.

AST/UST Recommendation:

- ✓ Ensure that the UST has a containment structure that will contain spills and leaks.

Section 3: Source Water Protection Conclusions and Recommendations

Protection Planning – The Town of West Bridgewater currently does not meet DEP's Wellhead Protection regulations, 310 CMR 22.21(2). The Water Department Superintendent reports that the Town of Easton protects the portion of Zone II #331 that extends into that community

The Water Department does not have a local Wellhead Protection Plan. A protection plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance *Developing a Local Wellhead Protection Plan*.
- ✓ Adopt a local bylaw or Board of Health regulation that meets the requirements of 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Current Land Uses and Source Protection:

As with many water supply protection areas, this system's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through

- ? working with town officials in West Bridgewater, Easton and Brockton to protect the public wells;
- ? conducting regular inspections of the water supply protection areas; and
- ? acquiring land where needed for source protection.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Continue to inspect the Zone I regularly.
- ✓ Develop a wellhead protection plan.
- ✓ Educate residents on ways they can help protect drinking water.
- ✓ Work with emergency responders to ensure that they are aware of the stormwater drainage in your Zones I & II and to cooperate on responding to spills or accidents.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, documents, and other resources are available to help you build on this SWAP report to continue to improve drinking water protection. Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Source Protection Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, Residents Protect Drinking Water, Boards of Health Protect Drinking Water, Planners Protect Drinking Water and DPWs Protect Drinking Water.*
- B. List of Regulated Facilities
- C. Table of DEP Tier Classified Oil or Hazardous Material Release Sites

APPENDIX B - DEP Permitted Facilities

REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA IN WEST BRIDGEWATER (WB)

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
33482	F & F Custom Auto	North Main St.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG
33765	South Shore Truck & Trailer	Manley St.	WB	Small Quantity Generator of Hazardous Waste	SQG
34213	D & M Auto Body	North Main St.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG
37850	Noonan Transportation	West St.	WB	Small Quantity Generator of Hazardous Waste; Air Quality Permit; Industrial Waste Water Holding Tank; Transfer Station for Hazardous Material	SQG; BLW-AQ; IWWHT; TRSTN
120742	Sheehan Engine Rebuilder	North Main St.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG
131214	Shawmut Mills	Manley St.	WB	Large Quantity Generator of Hazardous Waste; Large Quantity Toxic User	LQG; LQTU
132217	Double E Co.	Manley St.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG
178028	Ryder Truck Rental	Manley St.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG
212822	General Sand-blasting	Turnpike St.	WB	Very Small Quantity Generator of Hazardous Waste; Air Quality Permit	VSQG; BM150
272781	Chadwicks	United Dr.	WB	Groundwater Discharge	GROMAJ
301359	Imperia	Manley St.	WB	Air Quality Permit	BM150
322199	Arcadia Press	Bert Dr.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG
368109	Mobil/Exxon	West Center St.	WB	Fuel Dispenser; Very Small Quantity Generator of Hazardous Waste	FULDSP; VSQG
369246	All American Stripping	Turnpike St.	WB	Air Quality Permit	BLW-AQ
373627	AJS Gas & Propane (Travellers)	North Main St.	WB	Fuel Dispenser	FULDSP
376397	User Friendly Recycling	Bert Dr.	WB	Very Small Quantity Generator of Hazardous Waste	VSQG

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

APPENDIX C – Table of Tier Classified Oil and/or Hazardous Material Release Sites Within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0015668	1205 Belmont Street	Brockton	oil and hazardous material
4-0011696	1205 Belmont Street	Brockton	oil
4-0000192	1234 Belmont Street	Brockton	not listed in database
4-0015782	Pearl Street	Brockton	not listed in database
4-0011916	411 West Street	West Bridgewater	oil
4-0001236	436 West Street	West Bridgewater	oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Westport Harbor Aqueduct Company

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
February 2004

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Harbor Aqueduct Company
PWS Address	25 Perch Rock Road (P.O. Box 3997)
City/Town	Westport
PWS ID Number	4334001
Local Contact	Ben Gifford/ Randall Clarkson (Certified Operator)
Phone Number	(508) 636-4760/(508) 324-2723

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	260	659	Moderate
Well #2	02G	260	659	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Westport Harbor Aqueduct Company has two wells that provide drinking water to 57 dwellings. The wells have Zone Is of 260 feet and an Interim Wellhead Protection Areas (IWPAs) of 659 feet. An IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs.

The wells have no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **septic systems;**
3. **residential development; and**
4. **vehicle parking and roads.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of threats with moderate rankings the Zone I and IWPA.

1. **Zone Is** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The Zone Is contain residential houses, septic systems, gravel roads, vehicle parking and the public water supplier does not own or control all the land encompassed by the Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Educate residents on proper septic system maintenance and operation.
 - ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
2. **Septic Systems**– All of the residences within the Zone I and IWPA use septic systems or cesspools for their wastewater disposal. Private septic systems are potential sources for the introduction of hazardous chemicals and microbial contaminants into the aquifer.

Recommendation:

- ✓ Septic system components should be inspected and maintained on a regular basis.
- ✓ Educate residents on proper disposal of hazardous wastes, never dispose of hazardous materials down the drain.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
septic system	Yes	Yes	Moderate	bacteria, improper disposal of hazardous materials
residential development	Yes	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks (fuels or heating oil)
Vehicle Parking and Road	Yes	Yes	Moderate	stormwater runoff, leaks and spills

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

3. Residential Development – There is medium density residential development within the IWPA.

Recommendation:

- ✓ If possible, contact residents in the IWPA about water supply protection. A brochure is included in this packet.
- ✓ Instruct the residents and lawncare/landscaping professionals never to use fertilizers or pesticides within the Zone I.
- ✓ Use best management practices when applying fertilizers or pesticides within the IWPA.

4. Vehicle Parking and Roads – Vehicle parking and roads are potential sources of contamination to groundwater wells from leaks and spills of automotive fluids. Runoff and spills from roads can contaminate public wells.

Recommendation:

- ✓ Maintain contact with the Fire Department about spills.
- ✓ Direct road runoff away from Zone I.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination.

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone Is.
- ✓ Remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Post water supply protections signs in the Zone Is and IWPA.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of

vandalism.

- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Keep road and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Educate residents on proper hazardous material use, disposal, emergency response, and best management practices.
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

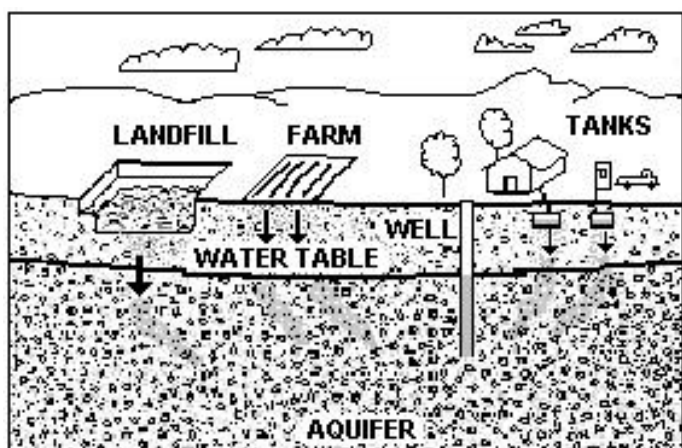


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Lee's Supermarket

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

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Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
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Drinking Water Program

Date Prepared:
August 17, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Lee's Supermarket
PWS Address	796 Main Road
City/Town	Westport, Massachusetts
PWS ID Number	4334008
Local Contact	Albert Lees
Phone Number	508 636-3348

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334008-01G	100	422	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

Lee's Supermarket receives its water from Well #1 which is located in a pit below the supermarket floor on the north side of the building. There are no boring logs available for Well #1. The well is believed to be 54 feet deep. Monitoring wells located across Main Street encountered bedrock approximately 50 feet below the ground surface. Therefore, it is likely that Well #1 is a sand and gravel well located just above the bedrock surface. Based on the current Zone I of 100 feet and Interim Wellhead Protection Area (IWPA) of 422 feet, the average daily withdrawal for the well is limited to 1000 gallons per day. The Department utilized Title 5 water use estimates included on sewage system repair plans approved by the Westport Board of Health on July 17, 1996.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. Clay layer) that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

Lee's Supermarket is sampling for volatile organic compounds (VOCs) annually as part of its routine sampling requirements. Methyl-tertiary-Butyl ether (MtBE) has been detected at concentrations less than Massachusetts drinking water guidelines of 70 ppb in groundwater samples collected from Well #1 in April 2001 and July, August 1999. Groundwater samples collected from Lee's supermarket Well #1, as well as private wells in the vicinity have been tested for VOCs as part of an investigation into leaking underground storage tanks at the Town Hall 816 Main Road (RTN 413584) and Cumberland Farms at 809 Main Road (RTN 413684). Groundwater samples collected from Well #1 as part of these investigations contained MTBE at 6.5 ppb and 3.8 ppb during June 2000 and January 2001 sampling grounds, respectively.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **INAPPROPRIATE ACTIVITIES IN ZONE I;**
2. **STORAGE, USE AND HANDLING OF HAZARDOUS MATERIALS,**
3. **SEPTIC SYSTEM,**
4. **UNDERGROUND STORAGE TANKS (UST),**
5. **PRESENCE OF OIL OR HAZARDOUS MATERIAL CONTAMINATION SITES.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Fuel Storage Below Ground	No	Well #1	High	Two (2) 10,000 gallon gasoline, double walled, leak detection
Storage, use, and handling of hazardous materials	Well #1	Well #1	Moderate	Household hazardous materials, cleaning and maintenance supplies for supermarket,
Parking lot, driveways & roads	Well # 1	Well #1	Moderate	Limit road salt usage
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the Attachments
Fuel Storage Above Ground	No	Well #1	Moderate	There are several ASTs associated with surrounding municipal and retail properties.
Small Qty Generator	No	Well #1	Moderate	Westport Highway Garages
Oil or Hazardous Materials Sites	No	Well #1	-	Refer to appendix

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains the supermarket buildings, supermarket parking areas, a transformer and landscaped areas.

Recommendations:

- ✓ Public water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Examples of modification or expansion include the addition of buildings, temporary or permanent, and increased water use due to an increase of staff.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ There is one transformer located approximately 100 feet south of Well #1. All electrical transformers contain oil and depending on the age of the transformer, the oil may contain PCBs. According to supermarket staff the transformer was installed in 1995 and therefore would not contain PCBs. Keep the area near transformers free of tree limbs that could endanger the transformer in a storm.

2. **Storage, Use, and Handling of Hazardous Materials: Supermarket** - If managed improperly, household hazardous materials can all contribute to groundwater contamination. Hazardous materials may include automotive products, household cleaners paints, solvents, pesticides, and other substances. The materials within the supermarket pose a potential threat to the well due to their large amounts, proximity and potential for accidental release.

Recommendation:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ To learn more, refer to the hazardous materials guidance documents at www.state.ma.us/dep/bwp/dhm/dhmpubs.htm and the household hazardous waste documents available at <http://www.state.ma.us/dep/recycle/hazards/hhwhdome.htm>

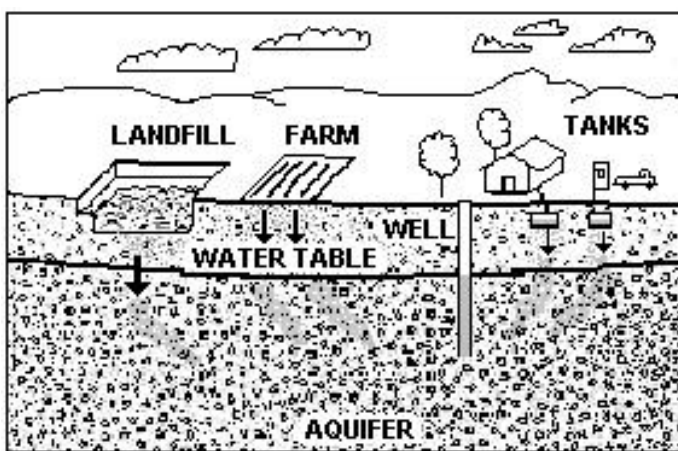


Figure 1: Example of how a well could become contaminated by different land uses and activities.

(2. Continued) Storage, Use, and Handling of Hazardous Materials - Town Highway Department

The Highway Department uses and store supplies of motor oil, antifreeze, and other automotive related products. This facility generates small quantities of hazardous waste and waste oil through its normal daily operations. This facility is registered as a waste generator with the Department and has a contract with a licensed hauler to remove the hazardous waste off-site. Hazardous waste is a potential source of contamination if it is properly handle or stored. The Town of Westport Highway Department recycles waste oil in an on-site space heater. Additionally, road salt is stored in an on-site building.

Recommendation:

- ✓ **Municipal facilities** - Work with the town to promote best management practices at municipal facilities such as maintenance and highway garages. Refer to: <http://www.epa.gov/region1/steward/neeat/munis1.html>
- ✓ Information on requirements for hazardous waste generators is available in the document entitled "A

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

Summary of Requirements for Small Quantities Generators of Hazardous Waste" and at the Department web site <http://www.state.ma.us/dep/bwp/dhm>.

3. **Septic Systems**- The septic system consists of two subsurface leaching fields located within the IWPA. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply. Plans for a septic system repair at the supermarket were approved by the Board of health on July 17, 1996. A new leaching area with a 1000 gallons per day design flow was installed 240 feet east-southeast of the well. The pre-existing leaching field was maintained and is used alternately with the new leaching area. The pre-existing leaching field is located 180 feet east of the well.

Recommendations:

- V Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
- V Educate workers on septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Workers should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>
- V Monitor water usage, as exceeding the septic system design capacity could cause premature failure of the septic system.

4. **Underground Storage Tank (UST)**-There are two (2) double walled 10,000 gallons gasoline UST with leak detection located approximately 300 feet west of Well #1 (i.e. gas station). If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendation:

- V Work with the local fire Department and UST owner to ensure compliance with local code requirements regarding USTs.
- V During refilling of UST, the UST owner should ensure that the operator of the oil transport tanker does not leave the vehicle while the UST is being filled.
- V The UST owner should ensure that the delivery operator has determined the tanks available oil capacity to prevent overfilling (refer to 527 CMR 8.00).

5. **Presence of Oil or Hazardous Material Contamination Sites** – The Zone II contains DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 4-13584, and 4-13684. Refer to the attached map and the Appendix for more information.

Recommendation:

- V Monitor progress on any ongoing remedial action conducted for the known oil

or contamination sites.

Other activities noted during the assessment: There are a gasoline and a diesel aboveground storage Tank located in a concrete spill protection enclosure at 816 Main Road. The aboveground tanks are just outside the IWPA of Well #1. AST's can be a potential source of contamination due to the spill or leaking of contents they store. Work with the town of Westport to ensure that during refilling of AST, the operator of the petroleum transport tanker does not leave the vehicle while the AST is being filled. Ensure that the delivery operator has determined the tanks available oil capacity to prevent overfilling.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Lee's Supermarket is commended for current protection measures. Storm water from the parking lot area between the building and Main Street is diverted out of the Zone I through grading, catch basins and piping to a storm water retention basin located on the eastern perimeter of the IWPA. A new grease trap system was installed to prevent clogging of the septic system. All UST's associated with Lee's Supermarket have been previously removed. During the site visit, the Department noted that the previous years water meter reading exceeded the 1000 gallons per day withdrawal limit. The Department recommended leak detection program be conducted and that water meter readings be monitored in the future since the bathrooms at the facility had been renovated to include low flow toilets and automatic shut off devices on the sinks. A review of recent water meter readings indicates the current average water usage is 958 gallons per day. The Department recommended you continue to monitor water usage for compliance with the average approved daily withdrawal limit of 1000 gallons per day. Lee's Supermarket should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Consider propane or natural gas for back-up power sources.

Training and Education:

- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff from Main Road and adjacent properties are directed away from the well and are treated according to DEP guidance.

Planning:

- ✓ Work with local officials in Westport to include Lee's supermarket IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form

5. Appendix

Table of DEP Regulated Chapter 21E Hazardous Materials Release Sites



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Westport Town Hall Annex/Administration Building

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Town Hall Annex/Administration Building
PWS Address	856 Main Road
City/Town	Westport, MA 02790
PWS ID Number	4334009
Local Contact	Linda Correia
Phone Number	508-324-2723

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	112	427	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

The well provides drinking water to Westport's Administration Building and Town Hall Annex. The well has a Zone I of 112 feet and an Interim Wellhead Protection Area (IWPA) of 427 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

The well serving the facility has pH adjustment treatment approved by the Department. DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I issues, including a residence with a septic system.
2. Public Building Complex, including Town Hall Annex, Parking Lot & Preschool
3. Residential Development, including fuel storage tanks
4. Transportation Corridor
5. Commercial Office - Veterinarian

The overall ranking of susceptibility to contamination for the well is HIGH based on the presence of multiple threats within the Zone I and IWPA and the lack of ownership of the entire Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Residential Development (including septic systems, fuel tanks)	Yes - residence & septic system	Yes	H	spills or leaks from fuel delivery & storage; microbial contaminants from septic systems; pesticides or fertilizers from lawn care
Public Building Complex, including Town Hall annex, preschool, parking lot (30 spaces)	Yes	Yes	M	spills or leaks of materials and wastes from buildings and parking lot
Transportation Corridor	edge	Yes	M	leaks or spills of fuel and other substances
Commercial Office (veterinary)	No	Yes	M	spills or leaks of medical & pet wastes

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Zone I** – The public water system posts water supply awareness signs but does not own or control the entire Zone I.

Recommendations:

- ✓ As much as possible, keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I.
- ✓ Enter into an agreement with the homeowner in the Zone I to maintain their septic system and not use pesticides or fertilizers on the lawn.

2. **Residential Development** – The Zone I and IWPA consist of 49% residential development. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Recommendation:

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

2. **Town Hall Building, Parking Lot, Preschool** - within the Zone I & IWPA.

Recommendations:

- ✓ Use BMPs for handling, storing, using and disposing of wastes.
- ✓ Do not use fertilizers, pesticides or de-icing chemicals.
- ✓ Train employees in water supply protection.

3. **Transportation Corridor - Stormwater** – A local road runs through the IWPA on the edge of the Zone I. Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing. Spills from vehicular accidents can also contaminate public drinking water sources.

Recommendation:

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.

4. **Commercial Office – Veterinarian** – within the IWPA.

Recommendation:

- ✓ Encourage the use of BMPs for handling, storing, and disposing of medical and pet wastes.

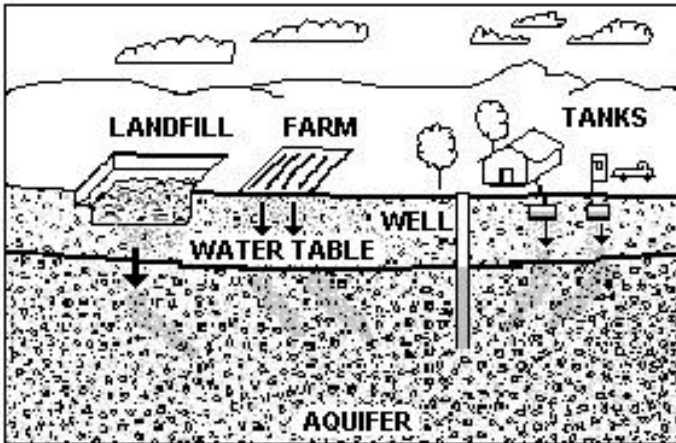


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. Facility operators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Inspect the Zone I.

Training and Education

- ✓ Train employees on the proper use, handling, storage and disposal of chemicals or wastes.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Padlock the wellhead.

Planning

- ✓ Include the well's IWPA in a local Aquifer Protection District Bylaw.

Funding

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures fact sheet
- Residents Protection Drinking Water fact sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
St. George School

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, established under the federal Safe Drinking Water Act, requires every state to:

- ? inventory land uses within the recharge areas of all public water supply sources;
- ? assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? publicize the results to provide support for improved protection.

**SWAP and
Water Quality**

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Table 1: Public Water System (PWS) Information

PWS NAME	St. George School
PWS Address	12 Highland Avenue
City/Town	Westport, MA 02790
PWS ID Number	4334010
Local Contact	Reverend Hebert/David Emond
Phone Number	508-636-2644/508-674-0527

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	100	422	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to you.

This report includes:

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Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program
Date Prepared:
October 2003

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
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In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

Well #1 provides drinking water to approximately 200 people at the St. George School. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 422 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map for land uses that are located within the Zone I and IWPA.

DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the public water system person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

Key issues include the following.

1. Zone I Issues (school, parking)
2. Residential
3. Transportation Corridors
4. Cropland

The overall ranking of susceptibility to contamination for the well is MODERATE based on the presence of at least one MODERATE threat within the Zone I and IWPA.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
School, Parking	Yes	Yes	Moderate	leaks or spills of chemicals from laboratories, art & photographic studios, machine shop; runoff from parking lot
Residential	No	Yes	Moderate	spills or leaks from fuel delivery & storage; microbial contaminants from septic systems; pesticides and fertilizers from lawn care
Transportation Corridors	access road	Yes	Moderate	leaks or spills of fuel and other substances; contamination from vehicular accidents; over-application or spills of pesticides for vegetation management along rights-of-way

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

1. **Zone I** – The public water system owns or controls the entire Zone I and conducts inspections. The school and 100 spaces of parking are located within the Zone I. The public water system does not meet DEP's Zone I requirements because of non-water supply activities within the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations

- ✓ As much as possible, keep non-water supply activities out of the Zone I.
- ✓ Do not use pesticide, fertilizers or de-icing materials within the Zone I.
- ✓ Post water supply protection signs in the Zone I.

2. **Residential** – Thirty-three percent (33%) of the IWPA consists of residences. In addition to potential threats from spills or over-application of pesticides and fertilizers used for lawn care, the following activities are potential contaminant sources associated with residential land uses.

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.

Recommendation

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

3. **Transportation Corridors** – Local roads are located within the IWPA. Leaks and

spills, vehicular accidents, and over-application or spills of pesticides are potential sources of contamination.

In addition, stormwater from roadways and adjacent properties flows over, and discharges to, the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance and washing.

Recommendations

- ✓ Wherever possible, ensure that drains discharge to outside the Zone I and IWPA.
- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.

4. **Cropland** – Twenty percent (20%) of the IWPA is used as cropland. The water system reports that fertilizers and pesticides are not used or stored within the IWPA.

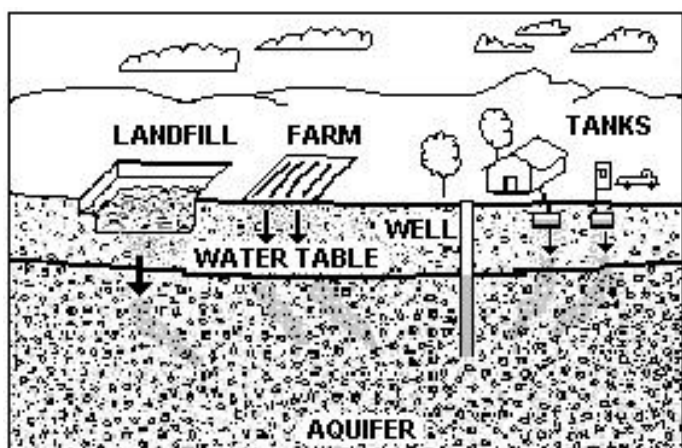


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land/Associated Contaminants Matrix.

Copies of this assessment have been made available to the public water supplier and town boards.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. School and town administrators should review and adopt the key recommendations above and in the following sections.

Priority Recommendations:

Zone I

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Continue to inspect the Zone I.
- ✓ Post water supply protection signs in the Zone I.

Training and Education

- ✓ Educate residents on source protection measures for protecting water supplies. Distribute the enclosed fact sheet *Residents Protect Drinking Water*.
- ✓ Educate staff and students on the proper use and disposal of chemicals and other substances.
- ✓ Incorporate water supply protection information into the school curriculum.

Facilities Management

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Review the enclosed *Healthy Schools* fact sheet.

Planning

- ✓ Work with town officials to improve water supply protection.

Funding

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply Protection Area
- Recommended Source Protection Measures fact sheet
- Healthy Schools fact sheet
- Residents Protect Drinking Water fact sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Westport Middle School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 5, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Middle School
PWS Address	400 Old Country Road
City/Town	Westport, Massachusetts
PWS ID Number	4334011
Local Contact	Mike Duarte
Phone Number	508 636-1101

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334011-01G	174	470	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for Westport Middle School is a public water supply currently serving the schools students and staff. Well #1 is located in a well pit 50 feet north of the school. Well #1 is a bedrock well drilled to a depth of 400 feet. Based on the current Zone I of 174 feet and an Interim Wellhead Protection Area (IWPA) of 470 feet, the average daily withdrawal for the well is limited to 3114 gallons per day. The Zone I and IWPA protective radii are based on metered water readings. Please refer to the attached map of Zone I and IWPA. Well #1 is located in a bedrock aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminate migration. A natural gas powered generator provides emergency power.

The well serving the Westport Middle School has no treatment at this time. The Westport Middle School is interconnected with the Westport Elementary School to

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

provide water in an emergency. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is,**
2. **Athletic Fields,**
3. **Potential discharge of Industrial Wastewater to the septic system,**
4. **Stormwater,**
5. **Septic system.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one Moderate threat land use or activity in the Zone I, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. Well #1's Zone I contains athletic fields and school buildings. The public water supplier does own all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Examples of modification or expansion include the addition of buildings, temporary or permanent, and increased water use due to an increase of staff and students.

Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If the school intends to continue using the structures, driveways, athletic fields and parking areas in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Drinking water protection signs were not posted at the time of the site visit. The Department recommends posting drinking water protection area signs at key visibility locations.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Athletic Fields	Well #1	Well #1	Moderate	Fertilizer and pesticide use
Industrial Wastewater	No	Well #1	Moderate	Science classroom and boiler blowdown discharge to septic system
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Well #1	Moderate	One resident
Septic System	No	Well #1	Low	Refer to attachment on septic systems
Structures	Well #1	Well #1	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Athletic Fields** - There are playing fields located within the Zone I and IWPA of Well #1. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply.

Recommendations:

- ✓ Use BMPs for applying, handling and storing of pesticides and fertilizers.
- ✓ Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

3. **Industrial Wastewater**- Discharge from science classrooms and boiler blow down is required to go to a tight tank or sewer. A sump was observed in the boiler room. The sump receives all boiler room drainage and discharge via a sump pump to the septic system.

Recommendations:

- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Please contact Jeff Gould in the Department's Water Pollution Control section at 508-946-2757 in order to discuss your management options.

4. **Storm Water** – There are two (2) parking areas located south and east of Well #1 Zone I. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. There are no catch basins or storm water structures for the parking lots.

Recommendations:

- ✓ The Department recommends the public water supplier consider nonstructural techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff. Additionally, the public water supplier may want to consider structural BMPs (e.g. stormwater swales, installation of curbs along the paved areas, detention basin, catch basins etc.) as part of a comprehensive storm water management plan for the site (refer to Storm Water Management Handbook, Volume 1 and 2 for information on BMPs).

5. **Septic System**-A portion of school's septic system is located within the IWPA of the well. If the septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous

chemicals to septic systems is a potential source of contamination to the water supply.

Recommendations:

- ✓ Staff should be instructed in the proper disposal of spent household chemicals (Include custodial staff, groundskeeper and certified operator).
- ✓ Septic system component should be located, inspected and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.
- ✓ Avoid septic tank cleaners, especially those with acids and solvents.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management

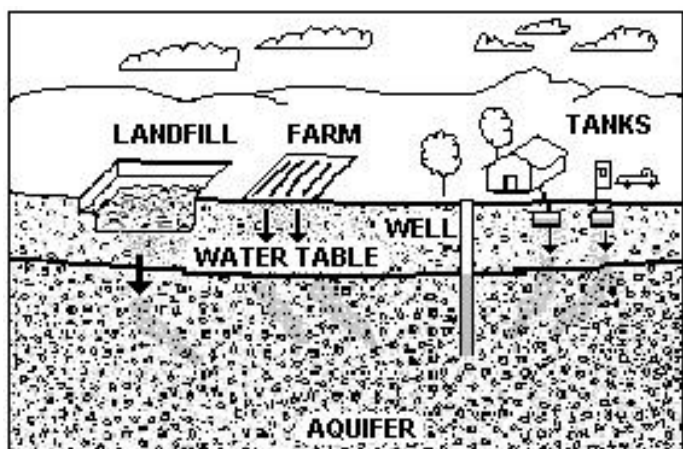


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

practices (BMPs) will reduce the wells' susceptibility to contamination. Westport Middle School is commended for its previous program of UST removal and its conversion of the heating system from oil to natural gas. Westport Middle School should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well pit for Well #1 by locking facilities, gating roads, and posting signs.
- ✓ Well #1 is a vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18 inches above the final grade of the surface as part of future modifications to Well #1.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff from local roads is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.

Planning:

- ✓ Work with local officials in Westport to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.
- ✓

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials

should use this SWAP report to spur discussion of local drinking water protection measures.

4 Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide and Fertilizer Use Fact sheets
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheets
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Westport High School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
June 8, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Westport High School
PWS Address	19 Main Road
City/Town	Westport, Massachusetts
PWS ID Number	4334012
Local Contact	Mike Duarte
Phone Number	508 636-1101

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334012-01G	193	492	High
Well #2	4334012-02G	193	492	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The wells for Westport High School are a public water supply currently serving a population of 598 students and staff. Well #1 is located in a well pit 350 feet west of the school. Well #2 is located in the basement of the school buildings. Well #1 and Well #2 are bedrock wells drilled to a depth of 346 feet and 140 feet, respectively. Well #1 and Well #2 have a Zone I of 193 feet and an Interim Wellhead Protection Area (IWPA) of 492 feet. The Zone I and IWPA protective radii are based on metered water readings. Please refer to the attached map of Zone I and IWPA. Well #1 and Well #2 are located in a bedrock aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminate migration. A diesel-powered generator provides emergency power.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The wells serving the Westport High School have no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is,**
2. **Floor Drain in Maintenance Garage with Oil/hazardous materials storage,**
3. **Potential discharge of Industrial Wastewater to the septic system,**
4. **Stormwater.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the Zone I, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. Well #1's Zone I contains athletic fields school driveways and parking areas. Well #2's Zone I contains school buildings, athletic fields, school driveway and parking areas, and an AST. The public water supplier does own all land encompassed by the Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If the school intends to continue using the structures, driveways, athletic fields and parking areas in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.

2. **Floor Drain** - Floor drains that ultimately lead to the soil via a dry well or septic system are prohibited. A floor drain was observed within the maintenance area garages within the Zone I of Well #2 and IWPA of Well # 1. In order to determine its ultimate discharge location, the floor drain was snaked. The final discharge location could not be determined. There was no evidence of recent use the floor

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Floor drain	Well #2	Well #1, #2	High	Floor drain in maintenance building
Industrial Wastewater	No	Well #1, #2	Moderate	Science classroom and boiler blowdown discharge to septic system
Parking lot, driveways & roads	Well # 1, #2	Well #1, #2	Moderate	Limit road salt usage and provide drainage away from wells
Athletic Field	Well #1, #2	Wells #1 #2	Moderate	Fertilizer and pesticide use
Residential	No	Well #3	Moderate	3 Residences
Fuel Storage Above Ground	Well #2	Well #1, #2	Moderate	Diesel tank
Septic System	No	Well #1, #2	Low	Septic holding tanks and pumping station

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

drains at the time of the SWAP site visit. The floor drain at this location is a concern due to the current storage of gasoline, vehicle storage, and other chemical storage. Additionally, this area once served as the location for the high schools auto repair shop class.

Recommendations:

- ✓ Bring the floor drain into compliance with DEP's Regulations (refer to attachment-*Industrial Floor Drain Brochure*) by either:
 - I. Sealing the floor drain, if the floor drain is not needed (Plumbing inspector approval is acquired before sealing the drain. DEP form WS-1 is attached for this purpose) or,
 - II. Connect to a holding tank (Contact the UIC coordinator for the Southeast Region Office of the Department for additional technical assistance (Mark Dakers Tele. #508-946-2847).

3. **Industrial Wastewater-** Discharge from science classrooms and boiler blow down is required to go to a tight tank or sewer. A sump was observed in the boiler room. The sump receives all boiler room drainage and discharge via a sump pump to the septic system. The sump to is used to control flooding of the basement from groundwater and surface water infiltration.

Recommendations:

- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Please contact Jeff Gould in the Department's Water Pollution Control section at 508-946-2757 in order to discuss your management options.
- ✓ Westport High Schools is currently registered as a generator of hazardous waste. Review enclosed document entitled: "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your regulatory requirements.

4. **Storm Water** – Northeast of Well #1 Zone I is a large unpaved parking area. Additionally, there are paved parking areas and driveways within the Zone I of Wells #1 and #2. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Catch basins transport storm water from the roadway and adjacent properties to the ground.

Recommendations :

- ✓ Have catch basins inspected, maintained, and cleaned on a regular schedule.
- ✓ The Department recommends the public water supplier consider nonstructural techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff. Additionally, the public water supplier may want to consider structural BMPs (e.g. stormwater swales, installation of curbs along the paved areas, detention basin, etc.) as part of a comprehensive storm water management plan for the site (refer to Storm Water Management Handbook, Volume 1 and 2 for information on BMPs).

Other land uses of concern - There is a double walled AST, with leak detection and alarm, located approximately 50 feet south-southwest of Well #2 and 210 feet southeast of Well #1 area. The AST Tank and generator are secured within a chain-link

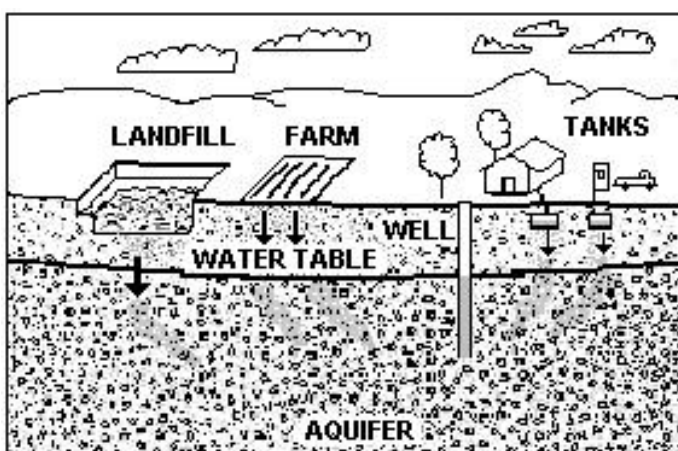


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact **Mark Dakers** in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

fence and enclosed within a shelter. If managed improperly, an AST in the Zone I/IWPA containing petroleum products is a concern due to the potential threat posed by a release of large quantities of fuel. Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check above ground tanks for leaks.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Westport High School is commended for its previous program of UST removal and its conversion of the heating system from oil to natural gas. Westport High School should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well pit for Well #1 by locking facilities, gating roads, and posting signs.
- ✓ Redirect road and parking lot drainage in the Zone I away from Well #1 and Well #2.
- ✓ Well #1 is a vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18 inches above the final grade of the surface as part of future modifications to Well #1.
- ✓ Well #2 casing appeared to be in need of repair during the SWAP site visit. Make necessary repairs to prevent surface water and groundwater infiltration into the well.

Training and Education:

For additional help regarding environmental requirements and toxic use reduction approaches to compliance contact the Office of Technical Assistance for Toxic Use Reduction (OTA). The OTA is a nonregulatory agency within the Commonwealth's Executive Office Environmental Affairs. OTA provides free, confidential assistance on toxic use reduction opportunities (Refer to attachment for additional information).

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Drinking water protection signs were not posted at the time of the site visit. The Department recommends posting drinking water protection area signs at key visibility locations.

- ✓ Work with your community to ensure that stormwater runoff from local roads is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.

- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in Westport to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

5. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide and Fertilizer Use Factsheets
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheets
- Chemical Management and Other Environmental, Health and Safety Issues in Schools
- Office Technical Assistance Factsheet
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- WS-1 Form



Source Water Assessment Program (SWAP) Report For Westport Village Commons

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
August 22, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Village Commons
PWS Address	770 Main Road
City/Town	Westport, Massachusetts
PWS ID Number	4334015
Local Contact	Mary Pasquariello
Phone Number	(603) 644-5236

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334015-01G	180	479	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for Westport Village Commons is a public water supply well currently serving a small shopping center consisting of a restaurant, pizza place, hair salon, veterinarian, video store, travel agency, optical center and one vacant unit. The well for Westport Village Commons is located in a forested area approximately 250 feet east of the rear parking lot. The well is six inches in diameter and is drilled to a depth of 125 feet. Well #1 has a Zone I of 180 feet and Interim Wellhead Protection Area (IWPA) of 479 feet that was established in a 1995 sanitary survey. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Lack of Ownership of Zone I,**
2. **Septic System,**
3. **Industrial Wastewater,**
4. **Veterinarian,**
5. **Stormwater Catchbasin.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one Moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone I**—Currently, the well does not meet the Department requirements that the public water supplier own or control all land encompassed by the Zone I. The Department records indicate that the northern edge of the Zone I for the well is 170 feet from the property line. The facility's Zone I is comprised entirely of forested woodland. Please note that systems not meeting Department Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Well #1 casing exhibited significant corrosion. Inspect well casing to determine if repairs are necessary to prevent surface water infiltration into the well.
- ✓ Keep non-water supply activities out of the Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the attachments
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Possible discharge of Industrial Wastewater to Septic System	No	Well #1	Moderate	Hair salon
Medical Facility	No	Well #1	Moderate	Veterinarian
Agricultural	No	Well #1	Moderate	Crop land
Structures	No	Well #1	-	

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

V Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. **Septic Systems** - If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals or industrial wastewater to the septic system is a potential source of contamination to the water supply.

Recommendations:

- V Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
- V Educate tenants on private septic systems about using cleaning compounds that are safe for the septic system, on proper disposal practices, i.e. only sanitary waste in the septic system. Tenants should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at mass DEP web site <http://www.state.ma.us/dep/brp/files/yoursyst.htm>

3. **Industrial Wastewater to Septic System**-Non-Sanitary and process flows from hair salons are classified as industrial wastewater and cannot be discharged to dry wells, storm drains or septic systems. If this wastewater was disposed to the ground or to storm drains this might endanger drinking water or surface waters.

Recommendations:

- V Determine if the hair salon has an industrial holding tank. If not contact the Westport Board of Health for additional guidance.
- V If the holding Tank is present, keep a monitoring log detailing inspections, maintenance and pump outs from the holding Tank on the premises. Monitor and maintain the holding tank in accordance with Department regulations and Board of Health requirements. Contact your local Board of Health to ensure that the holding Tank has been installed in accordance with Board of Health requirements.

4. **Veterinarian** - An animal hospital is located in the Westport Village Commons Plaza. Veterinarians may produce hazardous waste from photo processing (x-ray developing). Additionally, syringes, sharps, blood and blood products and, cultures are regulated by the Department of Public Health, state sanitary code Title VIII (105 CMR 480.000).

Recommendations:

- V For additional information refer to the Department fact sheet "Hazardous Waste Information for Medical Offices" which discusses xray waste and infectious waste recycling and disposal options.

5. **Storm Water Catch Basin** -East of the Zone I for Well #1 is the shopping center's paved parking area. Additionally, there are unpaved parking areas and driveways within the IWPA of Well #1. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Catch basins transport storm water from the roadway and adjacent properties to the ground.

Recommendations :

- V Have catch basins inspected, maintained, and cleaned on a regular schedule.

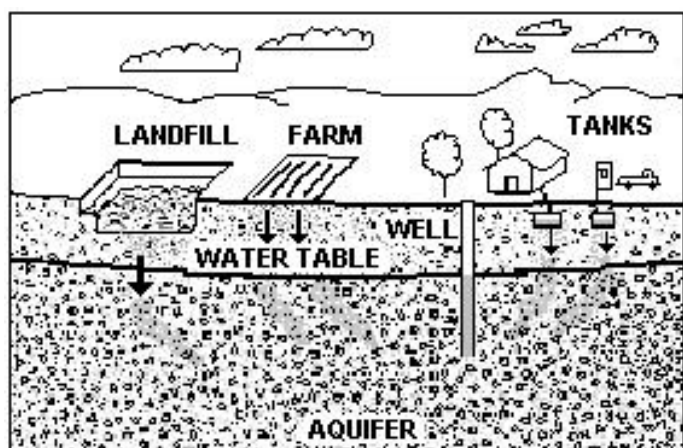


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

- V The Department recommends the public water supplier consider nonstructural techniques such as parking lot sweeping to reduce the amount of potential contaminants in storm water runoff. Additionally, the public water supplier may want to consider structural BMPs (e.g. stormwater swales, installation of curbs along the paved areas, detention basin, etc.) as part of a comprehensive storm water management plan for the site (refer to Storm Water Management Handbook, Volume 1 and 2 for information on BMPs).

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Westport Village Commons should review and adopt the **key recommendations above** and the following:

Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- V Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism; check any above ground tanks for leaks, etc.

Training and Education:

- V Drinking water protection signs were not posted at the time of the SWAP site visit. The Department recommends posting drinking water protection signs at key visibility locations.
- V Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- V Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- V Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- V Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank and be sealed.
- V Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- V Concrete pads should slope away from well and well casing should extend above ground.

Planning:

- V Work with local officials in Westport to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Agricultural:

- V Encourage farmers in the IWPA to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing

manure management issues.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Wellhead Protection Grant Program Fact Sheet
- Source Protection Sign Order Form
- Hazardous Waste Information for Medical Offices



Source Water Assessment Program (SWAP) Report For Westport Elementary School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 5, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Elementary School
PWS Address	380 Old Country Road
City/Town	Westport, Massachusetts
PWS ID Number	4334017
Local Contact	Mike Duarte
Phone Number	508 636-1101

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334017-01G	182	478	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for Westport Elementary School is a public water supply currently serving the schools students and staff. Well #1 is located in a well pit 500 feet south of the school. Well #1 is a bedrock well drilled to a depth of 400 feet. Based on the current Zone I of 182 feet and an Interim Wellhead Protection Area (IWPA) of 478 feet, the average daily withdrawal for the well is limited to 3521 gallons per day. The Zone I and IWPA protective radii are based on metered water readings. Please refer to the attached map of Zone I and IWPA. Well #1 is located in a bedrock aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminate migration. Emergency power is provided by two (2) generators, one natural gas and a diesel powered.

The well serving the Westport Elementary School is disinfected with chlorine. The

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Westport Elementary School is interconnected with the Westport Middle School to provide water in an emergency. A replacement well has been installed within 50 feet of the current well due to diminished capacity of existing Well #1. The new well is not online as water quality data is still being collected. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is,**
2. **Underground Storage Tank (UST),**
3. **Athletic Fields,**
4. **Hazardous Materials/Waste Oil Storage,**
5. **Potential discharge of Industrial Wastewater to the septic system.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the Zone I, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. Well #1's Zone I contains athletic fields. The public water supplier does own all land encompassed by the Zone 1. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Examples of modification or expansion include the addition of buildings, temporary or permanent, and increased water use due to an increase of staff and students.

Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If the school intends to continue using the structures, driveways, athletic fields and parking areas in the Zone 1, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Drinking water protection signs were not posted at the time of the site visit. The Department recommends posting drinking water protection area signs at key

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Underground Storage Tank	No	Well #1	High	100 gallon diesel tank without secondary containment, leak detection or cathodic protection
Hazardous Material/Waste Oil storage, handling and use	No	Well #1	Moderate	Waste oil and small amounts of chemical storage
Athletic Fields	Well #1	Well #1	Moderate	Fertilizer and pesticide use
Industrial Wastewater	No	Well #1	Moderate	Boiler blowdown discharge to septic system
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Septic System	No	Well #1	Low	Refer to attachment on septic systems

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

visibility locations.

2. **Underground Storage Tank** - Within the IWPA, a 100 gallon UST for diesel fuel is located just south of the school's garage. According to school staff the tank is believed to have been installed in 1978. If managed improperly, UST's can be potential source contamination due to leaks or spills of the chemicals they store. According to 527 CMR 9.00 storage tanks that do not have an acceptable form of leak protection or cathodic protection shall have tank tested at the owners expense. Additionally, all existing underground storage tanks are required to have been retrofitted with spill containment manhole and overflow protection devices on or before September 30, 1994 or removed from the ground.

Recommendation:

- ✓ Consult with the local fire department for specific code requirements regarding your USTs.
- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements.
- ✓ Upgrade to propane or natural gas for back-up power sources.

3. **Athletic Fields** - There are playing fields located within the Zone I and IWPA of Well #1. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply.

Recommendations:

- ✓ Use BMPs for applying, handling and storing of pesticides and fertilizers.
- ✓ Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

4. **Hazardous Materials/Waste Oil** - A maintenance garage located within the southern portion of the elementary school is within IWPA. The garage contained two (2) drums of waste oil (1-55 gal. drum, 1-35 gal. drum), gas cans, paint thinner and other small amounts of petroleum products, cleaners etc.

Recommendation:

- ✓ The school is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" to determine your status and regulatory requirements. Enclosed is a registration form for you to fill out and

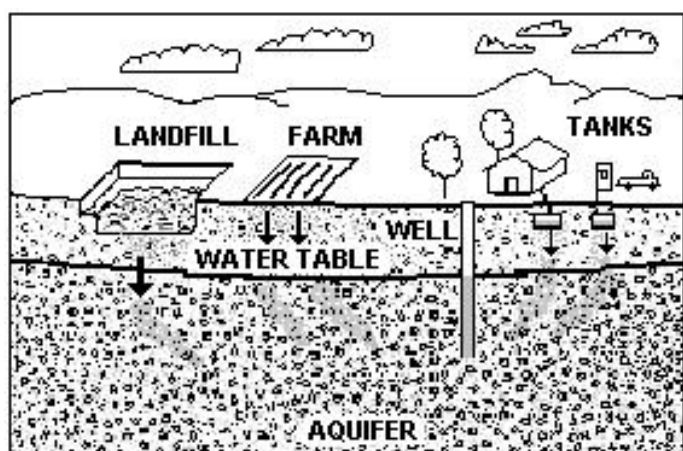


Figure 1: Example of how a well could become contaminated by different land uses and activities.

return to the Department.

5. **Industrial Wastewater**- Discharge from the boiler blow down is required to go to a tight tank or sewer. A sump was observed in the boiler room. The sump receives all boiler room drainage and discharge via a sump pump to the septic system.

Recommendations:

- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Please contact Jeff Gould in the Department's Water Pollution Control section at 508-946-2757 in order to discuss your management options.

Other activities noted during the assessment

Storm water for the parking area south of the school is routed by catch basins and culverts to an area outside of the IWPA, approximately 500 feet northeast of the well. As flowing storm water travels, it picks up debris and contaminants from streets,

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946 - 2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

and hazardous waste.

- V Work with your community to ensure that stormwater runoff from local roads is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- V Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- V Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.

parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents. Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule. Additionally, street and parking lot sweeping reduces the amount of potential contaminants in storm runoff.

The school's septic system is not located within the IWPA of the well (approximately 800 feet north of the well). However, if the septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply. Staff should be instructed in the proper disposal of spent household chemicals (Include custodial staff, groundskeeper and certified operator). Septic system component should be located, inspected and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

A dairy farm abuts the school property to the north. Encourage the farmer to seek assistance from the Natural Resource Conservation Service (NRCS) in addressing manure management issues.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Westport Elementary School is commended for its previous program of UST removal and its conversion of the heating system from oil to natural gas. Westport Elementary School should review and adopt the **key recommendations above** and the following:

Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Consider well relocation if Zone I threats cannot be mitigated.
- V Prohibit public access to the well pit for Well #1 by locking facilities, gating roads, and posting signs.
- V Well #1 is a vault/pit installation. Pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18 inches above the final grade of the surface as part of future modifications to Well #1.

Training and Education:

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials

- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.

Planning:

- ✓ Work with local officials in Westport to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4 Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide and Fertilizer Use Fact sheets
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheets
- Wellhead Protection Grant Program Fact Sheet
- A Summary of Requirements for Small Quantity Generators of Hazardous Waste
- Generator Registration Form
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Westport Plaza

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
November 6, 2001

Table 1: Public Water System (PWS) Information

<i>PWS NAME</i>	Westport Plaza
<i>PWS Address</i>	655 State Road
<i>City/Town</i>	Westport, Massachusetts
<i>PWS ID Number</i>	4334018
<i>Local Contact</i>	Bill Pirraglia
<i>Phone Number</i>	508 679-0197

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #1	4334018-01G	170	485	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Westport Plaza is a privately owned two-story commercial Plaza. Current tenants include a credit union, two restaurants, pharmacy, liquor store, florist, accountant, dance school and floor covering store. Well #1 depth is thought to be 35 feet. Well #1 is located in a well pit approximately ten feet from the Plaza building and 30 feet from the Southern property line. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. The average daily withdrawal for the wells is limited to 3815 gallons per day, based on the current Zone I of 170 feet and Interim Wellhead Protection Area (IWPA) of 485 feet. The 3815 gallons per day value is based upon Title 5 water use estimates for the Plaza. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA.

Westport Plaza has been placed on increased monitoring frequency for bacteria due to the presence of a septic system within the Zone I. Additionally, Westport Plaza has been placed on increased monitoring frequency for nitrate due to detection of nitrate > 5.0 milligrams per liter. Although the maximum contaminant level (MCL) has not been exceeded 310 CMR 22. 06(7) (c) state's relevant part, that for all public water systems, their repeat monitoring frequency for ground water system shall be quarterly for at least one year following any one sample in which the concentration is > 50 percent of MCL. MCL for nitrate is 10 milligrams per liter. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. The well serving the facility has no treatment at this time.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Septic System in Zone I,**
3. **Storage, Use and Handling of Oil/Hazardous Materials in Zone I,**
4. **Storm water.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, Well #1 fails to meet DEP's restrictions, which only allow water supply related activities in Zone I. The Zone I for Well #1 contains septic systems, the Plaza building, homes, a storage trailer, roads, and parking areas. The public water supplier does not own and/or control all land encompassed by the Zone I. The Southern portion of the Zone I is not owned by Westport Plaza. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- V To the extent feasible, remove all non-water supply activities from the Zone I to

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Storage, Use and handling of oil/hazardous material	Well #1	Well #1	High	Several storage containers
Parking, driveways & roads	Well #1	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Residential	Well #1	Well #1	Moderate	Lawn care, gardening, septic systems, household hazardous waste, heating oil storage
Septic System	Well #1	Well #1	Moderate	Refer to septic system brochure in the attachments
Storm water	Well #1	Well #1	Low	Several catch basins are located in IWPA with access road and roof runoff is Zone I
Structures	Well #1	Well #1	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please refer to the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

comply with DEP's Zone I requirements.

- ✓ Do not exceed the average daily withdrawal limit for this public water system of 3815 gallons per day.
- ✓ Well #1 is a vault/pit installations. Pit installations for water supply wells are not approved by the Department due to safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect the sanitary quality the water being delivered. Consider extending the Wellhead to 24 inches above the final grade of the surface as part of future modifications to the system.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If the Plaza intends to continue using the structures, driveways, and parking areas in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ Due to the proximity and number of potential sources of contamination, the Department recommends, and it may be required in the future, that the system investigate the availability of connecting to the municipal system.

2. **Septic Systems** - Septic systems for several private residences are located within the Zone I of Well #1. Additionally, the septic system for Westport Plaza is located within the IWPA of Well #1. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply.

Recommendations:

- ✓ Educate residents and tenants on private septic systems about using cleaning compounds that are safe for the septic system, and on proper disposal practices, i.e. only sanitary waste in the septic system. Tenants and residents should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at Massachusetts DEP website <http://www.state.ma.us/dep/brp/files/yoursyst.htm>
- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.

3. **Storage, Use and Handling of Hazardous Materials in Zone I** - Several dumpsters, a large storage trailer, and several other storage containers which contained oil/hazardous material storage are located within the Zone I. The oil/hazardous material storage (e.g. gasoline, paint, petroleum products, cleaning supplies, etc.)

poses a potential threat to the well due to its proximity and potential for accidental release.

Recommendations:

- ✓ Relocate dumpsters and hazardous product storage to a location outside of the Zone I and provide containment and exercise caution when using and storing these products.
- ✓ Educate tenants on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff and certified operator. Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. Post labels as appropriate on raw materials and hazardous waste. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.

4. **Storm Water** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet

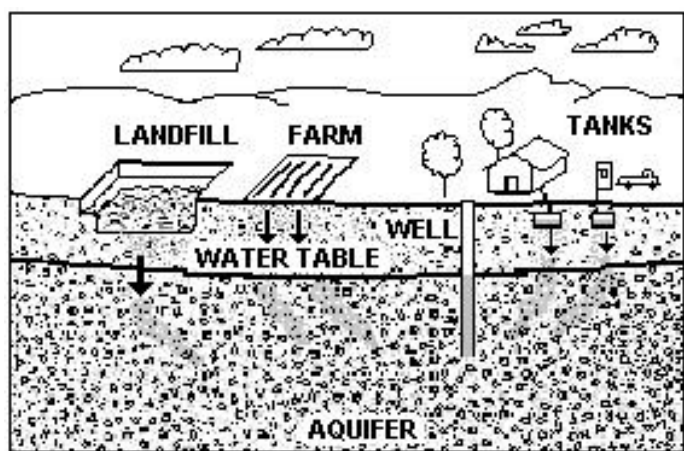


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- ✓ Street and parking lot sweeping reduces the amount of potential contaminants in storm runoff. Work with the Town to have the catch basins inspected, maintained, and cleaned on a regular schedule.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

2. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Westport Plaza should review and adopt the **key recommendations** above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, and evidence of vandalism.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

Training and Education:

- ✓ Drinking water protection signs were not observed during the SWAP site visit. Post drinking water protection area signs at key visibility locations.
- ✓ Educate residents on proper application of pesticides and fertilizers.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in Westport to include Westport Plaza's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands.

Keep the phone number of a bottled water company readily available.

- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding

opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Fertilizer Use Fact sheet
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet



Source Water Assessment Program (SWAP) Report For St. Vincent DePaul Camp

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May 2004

Table 1: Public Water System (PWS) Information

PWS NAME	St. Vincent DePaul Camp
PWS Address	573 Adamsville Road
City/Town	Westport, Massachusetts
PWS ID Number	4334059
Local Contact	Paul Michael
Phone Number	508 697-8511

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #2	4334059-02G	200	1000	High
Well #3	4334059-03G	200	1000	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas
5. Appendix

1. Description of the Water System

St. Vincent DePaul Camp is a public water supply that employs two (2) wells to serve the schools 52 students and staff. Well #2 and #3 are 6-inch bedrock wells drilled to a depth of 500 and 320 feet, respectively. The wells were approved by the Department in a letter dated February 11, 1994. Based on the current Zone I of 200 feet and the Interim Wellhead Protection Area (IWPA) of 1000 feet, the average daily withdrawal for the well is limited to 27,000 gallons per day. Please refer to the attached map of Zone I and IWPA. Well #2 and Well #3 are located in a bedrock aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminate migration. A diesel-powered generator provides emergency power.

For current information on monitoring results and treatment, please contact the Public

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is,**
2. **Storage, Use and Handling of Hazardous Material/Oil,**
3. **Aboveground Storage Tanks (AST) in IWPA,**
4. **Presence of Oil Contamination Site within the IWPA.**

The overall ranking of susceptibility to contamination for the wells is High, based on the presence of at least one High threat land use or activity in the Zone Is, as seen in Table 2.

1. **Zone Is** – Currently, the wells meet DEP's restrictions, which only allow water supply related activities in Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems. Examples of modification or expansion include the addition of buildings, temporary or permanent, and increased water use due to an increase of staff and students.

Recommendations:

- ✓ Prohibit public access to the well and pump house by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone Is. Look for illegal dumping, and evidence of vandalism, check any aboveground storage tanks for leaks, etc.
- ✓ The use or storage of pesticides, fertilizers or road salt within the Zone Is is prohibited.

2. **Aboveground Storage Tank** - In the basement of the hospitality center are two (2) 275 gallon steel AST containing heating fuel approximately 600 feet south of Well #2 and Well #3. In the basement of the day camp building there are two (2) 150-gallon AST's approximately 520 feet west of Well #2 and Well #3. In the basement of Dorm #1 there are two (2) 275 gallon AST, approximately 200 feet south of Well #2 and #3. If managed improperly, ASTs can be potential sources of contamination due to leaks or spills of the chemicals they store. There are sumps located in the basement of Dorm #1 and the day camp building to prevent flooding.

Recommendation:

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Hazardous Material/Waste Oil Storage, Handling and Use	No	Well #2, #3	High	Cellar of dorm #1, equipment building, woodworking shop
Aboveground Storage Tanks	No	Well #2, #3	Moderate	Heating oil AST in IWPA
Athletic Fields	No	Well #2, #3	Moderate	Fertilizer and pesticide use
Parking lot, driveways & roads	No	Well #3	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Well #2, #3	Low	Septic systems, fuel storage, landscaping
Septic System	No	Well #2, #3	Low	Refer to attachments
Oil or Hazardous Material sites	No	Well #2, #3	-	Refer to Appendix 1

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- V Consult with the local fire department for specific code requirements regarding your AST. Any modifications to the AST must be accomplished in a manner consistent with Massachusetts's plumbing, building, and fire code requirements.
- V The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valve to prevent leaks.
- V Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.

Recommendation implemented

Since the SWAP assessment visit, the school has provided 110 percent secondary containment for all aboveground storage tanks. St. Vincent DePaul received a Wellhead Protection Grant in 2000 from the Department of Environmental Protection to provide secondary containment for the two aboveground storage tanks in Dorm #1.

3. **Storage, Use and Handling of Oil/Hazardous Materials** - Cleaning supplies are stored in the cellar of Dorm #1 on the East side of the school complex within the IWPA. The equipment building contained cleaning supplies, flammable closet, gasoline, lawn mower and a floor drain. The wood workshop contained paints, cleaners, petroleum products etc.. The oil/hazardous material storage poses a potential threat to the well due to its proximity and potential for accidental release.

Recommendation:

- V Remove hazardous materials from rooms with floor drains or sump pumps that drain to the ground or septic systems. Provide containment and exercise caution when using and storing these products.
- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and certified operator. Post labels as appropriate on raw materials and hazardous waste.
- V Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.

4. **Presence of Oil Contamination Site within the IWPA** - The IWPA for Well #2 and

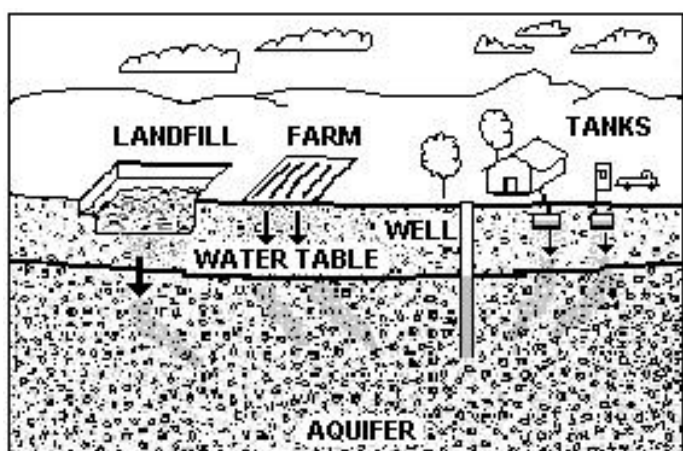


Figure 1: Example of how a well could become contaminated by different land uses and activities.

Well #3 contains DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 4-014409. Refer to the attached map and Appendix for more information.

Recommendation:

- V Monitor progress on any ongoing remedial action conducted for the known oil and/or Hazardous Material Release Site.

Other activities noted during the assessment

There are athletic fields located within the IWPA of Well #2 and #3. Over-application of pesticides and fertilizers on athletic fields is a potential source of contaminants to the water supply. Use BMPs for applying, handling and storing of pesticides and fertilizers. Refer to attachments, "Protecting Water Sources from Fertilizer" and, "Protecting Groundwater from Pesticides".

The septic system's leaching field for the St. Vincent DePaul

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946 - 2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, town boards, and the local media.

Camp is located approximately 600 feet southwest of Well #2 and #3. The Board of Health approved the septic system plans on June 29, 1994. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the water supply. Staff should be instructed on the proper disposal of spent household chemicals (include custodial staff, groundskeepers, and certified operator). Septic system components should be located, inspected, and maintained on a regular basis. Refer to the attachments for more information regarding septic systems.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Drinking water signs were posted at the time of the SWAP assessment visit. St. Vincent DePaul Camp should review and adopt the **key recommendations above** and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Work with your community to ensure that stormwater runoff from local roads is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in Westport to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and

incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide and Fertilizer Use Fact sheets
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheets
- Heating Oil Delivery Lines, A Homeowner's Guide to Preventing Leaks
- Wellhead Protection Grant Program Fact Sheet

5. Appendix

APPENDIX 1 – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-014409	500 Adamsville Road	Westport	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Source Water Assessment Program (SWAP) Report For Bittersweet Farm Inc.

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
June 22, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Bittersweet Farm Inc.
PWS Address	438 Main Road
City/Town	Westport, Massachusetts
PWS ID Number	4334065
Local Contact	Richard LaFrance
Phone Number	(508) 636-0085

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334065-01G	147	445	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Bittersweet Farm Inc. is a privately owned restaurant with the seating capacity of 180 persons. Bittersweet Farm is served by Well #1 that is located 280 feet east of the restaurant. Well #1 is a bedrock well drilled to a depth of 270 feet below grade. The well is located on the edge of the lawn and just north of the gated dirt access road. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (e.g. clay layers) that can prevent contaminant migration. In a July 23rd, 1998 sanitary survey, the Department assigned a Zone I of 220 feet and Interim Wellhead Protection Area (IWPA) of 540 feet based on septic system design flows of 6300 gallons per day. Subsequent to this determination of the Zone I and IWPA, the facility has collected two (2) years of metered water readings which the Department

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

has used to recalculate your wellhead protection area. Based on the daily average metered readings of 2042 gallons per day, the revised Zone I and IWPA are 147 feet and 445 feet, respectively. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is, and**
2. **Septic System,**
3. **Illegal Dumping,**
4. **Storage, Use and Handling of Oil/Hazardous Materials,**
5. **Lawn Care and Landscaping.**

The overall ranking of susceptibility to contamination for the well is Moderate, based on the presence of at least one Moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contain a landscaped area used for recreational activities. The public water supplier owns and/or controls all land encompassed by the Zone 1. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ The Department recommends posting drinking water protection signs at key visibility locations.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Illegal Dumping	No	Well #1	High	55-gallon drum removed
Storage, use and handling of oil/hazardous materials	No	Well #1	Moderate	Garage
Parking lot, driveways & roads	No	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Lawn Care and landscaping	Well #1	Well #1	Moderate	Fertilizer and pesticide use
Septic System	No	Well #1	Moderate	Refer to septic systems brochure in the attachments
Structures	No	Well #1	-	Non-water supply structures in Zone I

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

2. **Septic System** –A new septic system was installed in 1998. The new septic system leaching field was installed 177 feet from Well #1 under the current parking area. The septic system is designed for a 144 seat restaurant with a 36 seat lounge. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply.

Recommendations:

- ✓ Septic system components should be located, inspected, and maintained on a regular basis. Refer to attachment for more information regarding septic systems.
- ✓ Custodial staff and groundskeepers should be instructed on the proper disposal of spent cleaning chemicals.

3. **Illegal Dumping**-As part of the SWAP site visit, the Zone I and IWPA were assessed for potential sources of contamination. During the site visit a 55-gallon drum containing an unknown liquid was observed in the Zone I east of the well. A strong petroleum odor was present. The public water supply owner was notified and provided with the names of hazardous waste disposal contractors. Additionally, a dilapidated truck was observed in the IWPA east of the well.

Recommendation implemented: The drums contents were identified as waste oil and transported for proper disposal.

Additional Recommendations:

- ✓ Conduct regular inspections of the Zone 1 and IWPA. Look for illegal dumping and evidence of vandalism.
- ✓ Prohibit public access to the well by locking facilities, gating roads and posting signs.
- ✓ Remove truck from IWPA.

4. **Storage, Use and Handling of Hazardous Materials**-A garage is located within the IWPA of Well #1 just south of the restaurant building. The materials kept within the garage (e.g. gasoline, lawn mower, tractor, petroleum products, paint thinner) pose a

potential threat to the well due to the proximity potential for accidental release.

Recommendation:

- ✓ Use containment and caution when using and storing these products.

5. **Lawn Care and Landscaping**-Over application of pesticides and fertilizers on lawns is a potential source of contamination to the water supply.

Recommendation:

- ✓ Provide educational materials to staff about the proper application of pesticides or fertilizers. Additional, information on environmentally sound lawn care practices can be obtained from the Massachusetts Department of Food and Agriculture Pesticide Bureau's web site at <http://www.massdfa.org>.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

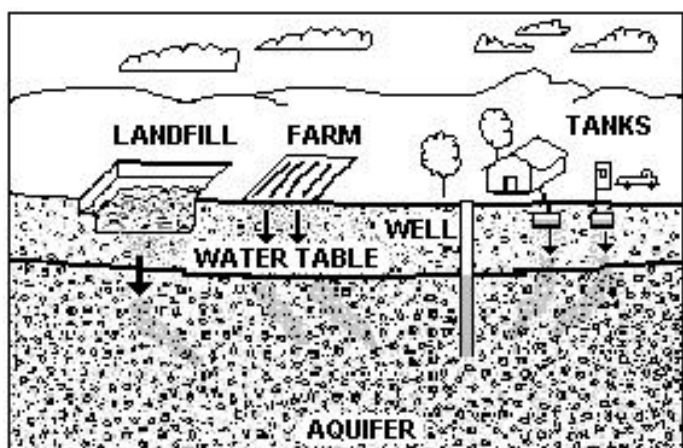


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the Well #1 susceptibility to contamination. Bittersweet Farm should review and adopt the **key recommendations** above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.
- ✓ Eliminate non-sanitary wastewater discharges to on-site septic systems. Instead, in areas using hazardous materials, discharge drains to a tight tank or sanitary sewer.
- ✓ Remove hazardous materials from rooms with floor drains that drain to the ground or septic systems.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in Westport to include Bittersweet Farm's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur

discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure

- Pesticide Use Fact sheet
- Fertilizer Use Fact Sheet
- Source Protection Sign Order Form



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Westport Country Day School

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
September 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Country Day School
PWS Address	1128 State Road
City/Town	Westport, Massachusetts 02790
PWS ID Number	4334073
Local Contact	Ann Mota, Randall Clarkson
Phone Number	508- 636-8404, 508-636-4330

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	100	422	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff is available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The well for the Westport Country Day School is located adjacent to the school. The well has a Zone I of 100 feet and an Interim Wellhead Protection Area (IWPA) of 422 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA. The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

results and treatment, please contact the public water system contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **non-water supply activities in Zone I;**
2. **above ground storage tank (AST) with heating oil;**
3. **septic system;**
4. **residential development; and**
5. **road.**

The overall ranking of susceptibility to contamination for the well is HIGH, based on the presence of multiple MODERATE rankings of non-water supply uses within the Zone I and the lack of ownership or control of the entire Zone I.

1. **Zone I** – Currently, the well does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The facility's Zone I contains part of the school building, playground, and a parking area. The public water supplier does not own or control all the land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. **Aboveground Storage Tank (AST)** – There is an AST with containment located within the IWPA. If managed improperly, above ground storage tanks can be a potential source contamination due to leaks or spills of the chemicals they store.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
school	Yes	Yes	Moderate	solvents & other materials used in classrooms
parking lot	Yes	Yes	Moderate	stormwater runoff, spills
lawn/playground	Yes	Yes	Moderate	fertilizer and pesticide use
above ground storage tank	No	Yes	Moderate	leaks, spills
septic system	No	Yes	Moderate	bacteria, improper disposal of hazardous materials
residential development	No	Yes	Moderate	runoff from lawns, septic systems, underground/above ground storage tanks
portion of road	No	Yes	Moderate	stormwater runoff, spills, road salt

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Aquifer: an underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: an underground layer of impermeable material that resists penetration by water.

Recharge Area: the surface area that contributes water to a well.

Recommendation:

Inspect and maintain the integrity of the containment structure.

3. Septic System – The septic system for the school is located within the IWPA.

Recommendation:

Septic system components should be inspected and maintained on a regular basis.

4. Residential Development – There is medium density residential development within the IWPA. Residential development totals 41% of the IWPA.

Recommendation:

If possible, contact residents in the IWPA about water supply protection. A brochure is included in this packet.

5. Road – Part of a road is located within the IWPA. Runoff and spills from roads can contaminate public wells.

Recommendation:

Continue to maintain contact with the Fire Department about spills.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Recommendations for Protection

Implementing protection measures will reduce the well's susceptibility to contamination. The Westport Country Day School is commended for replacing their underground storage tank with an above ground tank with containment. School officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep additional non-water supply activities out of the Zone I.
- ✓ Remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.

- ✓ Post water supply protections signs in the Zone I and IWPA.
- ✓ Prohibit public access to the well and pumphouse by locking facilities.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Keep driveway and parking lot drainage away from the well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

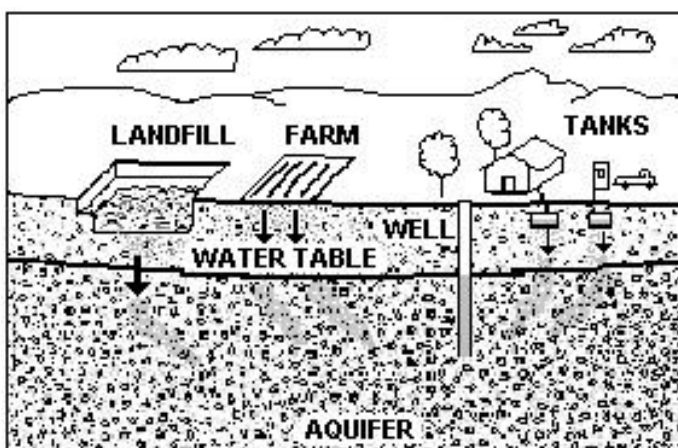


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

Additional Documents

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Incorporate groundwater education into school curriculum (K-6 and 7-12 curricula available; contact DEP for copies).
- ✓ Work with your community to ensure that stormwater runoff at the road is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Inspect and maintain the integrity of the containment structure for the AST.
- ✓ Septic system components should be inspected and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to make sure that the school's IWPA is included in the local Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures fact sheet
- Your Septic System brochure
- Healthy Schools fact sheet
- Residents Protect Drinking Water fact sheet
- Source Protection Sign Order Form



Source Water Assessment Program (SWAP) Report For Westport Investment Trust

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
October 31, 2001

Table 1: Public Water System (PWS) Information

PWS NAME	Westport Investment Trust
PWS Address	848 State Road
City/Town	Westport, Massachusetts
PWS ID Number	4334078
Local Contact	Steven Stallings
Phone Number	978 256-9961

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	4334078-01G	160	489	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Westport Investment Trust is a privately owned mixed commercial and residential facility consisting of four (4) commercial units and 18 apartments. Well #1 is located in the northwest corner of the property and is 260 feet deep. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration.

The average daily withdrawal for the wells is limited to 4000 gallons per day, based on the current Zone I of 160 feet and Interim Wellhead Protection Area (IWPA) of 489 feet. The 4000 gallons per day value is based upon Title 5 water use estimates for Westport Investment Trust. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. Please refer to the attached map of the Zone I and IWPA.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The well serving the facility has no treatment at this time. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone Is;**
2. **Auto Repair Shop,**
3. **Septic System in Zone I,**
4. **Storage, Use and Handling of Oil/Hazardous Materials in Zone I,**
5. **Storm water,**
6. **Presence of Oil Contamination Site within the IWPA.**

The overall ranking of susceptibility to contamination for the well is High, based on the presence of at least one High threat land use or activity in the IWPA, as seen in Table 2.

1. **Zone Is** – Currently, Well #1 fails to meet DEP's restrictions, which only allow water supply related activities in Zone I. The Zone I for Well #1 contains the west apartment units, paved perimeter drive, lawn areas and privately owned homes and property. The public water supplier does not own and/or control all land encompassed by the Zone I. The northwestern portion of the Zone I is not owned by Westport Investment Trust. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Do not exceed the average daily withdrawal limit for this public water system of 4000 gallons per day.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ If Westport Investment Trust intends to continue using the structures, driveways, and parking areas in the Zone 1, use BMPs and restrict activities that could pose a threat to the water supply.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Storage, Use and handling of oil/hazardous material	Well #1	Well #1	High	Small amounts in basement of western apartment units
Auto Repair Shops	No	Well #1	High	Automotive fluids
Parking, driveways & roads	Well #1	Well #1	Moderate	Limit road salt usage and provide drainage away from wells
Residential	Well #1	Well #1	Moderate	Lawn care, gardening, septic systems, household hazardous waste, heating oil storage
Septic System	Well #1	Well #1	Moderate	Refer to septic system brochure in the attachments
Oil or Hazardous Material sites	No	Well #1	-	Refer to Appendix

* -For more information on Contaminants of Concern associated with individual facility types and land uses please refer to the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ Due to the proximity and number of potential sources of contamination, the Department recommends, and it may be required in the future, that the public water supply investigate the availability of connecting to the municipal system.

2. **Auto Repair Shops** - Within the IWPA of Well #1 there are several vehicle maintenance and repair shops. Due to the daily operations these facilities generate very small quantities of hazardous waste/waste oil. These facilities are required to be registered with the Department and have a contract with a licensed hauler for removal of hazardous waste off-site. Hazardous waste is a potential source of contamination if it is a properly handle or stored.

Recommendations:

- ✓ Best Management Practices (BMPs) - Work with local businesses and your board of health to encourage proper hazardous material handling, storage, disposal, and emergency response planning (refer to attachments).
- ✓ Underground Injection Control - Work with your local Board of Health to educate local businesses about Underground Injection Control. Floor drains in areas where hazardous materials or wastes are stored must drain to a tight tank, be sealed, or be connected to a sanitary sewer. <http://www.state.ma.us/dep/brp/dws/files/uic.pdf>.
- ✓ Best Management Practices – Encourage local businesses to investigate where floor drains flow to, and if floor drains do not flow to a tight tank or sewer, comply with DEP UIC requirements. For more information, refer to <http://www.state.ma.us/dep/brp/dws/dwspubs.htm#uic>.

3. **Septic Systems** - The septic system for Westport Investment Trust is located within the Zone I of Well #1. If a septic system fails or is not properly maintained it could be a potential source of nutrients and microbial contamination. Improper disposal of household hazardous chemicals to the septic system is a potential source of contamination to the water supply.

Recommendations:

- ✓ Educate residents and tenants on private septic systems about using cleaning compounds that are safe for the septic system, and on proper disposal practices, i.e. only sanitary waste in the septic system. Tenants and residents should dispose of used oil, antifreeze, paints, and other household chemicals properly-not in septic systems. Information on septic systems can be found at Massachusetts DEP website <http://www.state.ma.us/dep/brp/files/yoursyst.htm>.
- ✓ Septic system components should be located, inspected, and maintained on a regular

basis. Refer to attachment for more information regarding septic systems.

4. **Storage, Use and Handling of Oil/Hazardous Materials in Zone I** - The basement of the western apartment complex contains gasoline, oil, paints and cleaning supplies. Additionally, a sump pump for flood control is located in the basement. The oil/hazardous material storage (e.g. gasoline, paint, petroleum products, cleaning supplies, etc.) poses a potential threat to the well due to its proximity and potential for accidental release.

Recommendation:

- ✓ Relocate hazardous product storage to a location outside of the Zone I or provide containment and exercise caution when using and storing these products.
- ✓ Remove hazardous materials from rooms with floor drains or sump pumps that drain to the ground or septic systems.
- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at

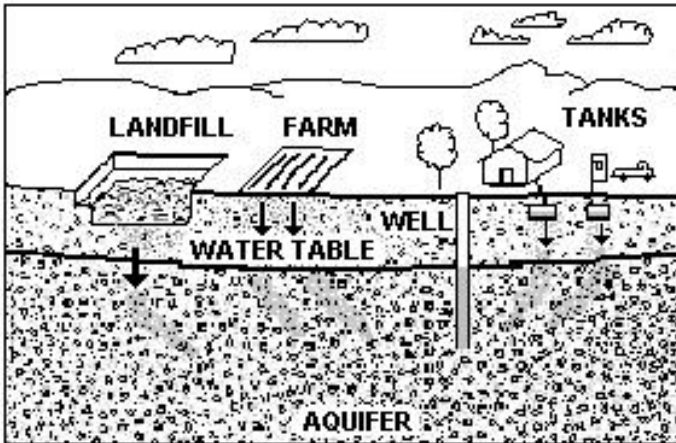


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Mark Dakers in DEP's Lakeville Office at (508) 946-2847 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the public water supplier, and town boards.

www.state.ma.us/dep/bwp/dhm/dhmpubs.html.

- V Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, and certified operator. Post labels as appropriate on raw materials and hazardous waste.

5. **Storm Water** – Catch basins transport storm water from the roadway and adjacent properties to the ground. As flowing storm water travels, it picks up debris and contaminants from streets, parking areas and lawns. Common potential sources of contamination include lawn chemicals, pet waste, leakage from dumpsters, household hazardous waste, and contaminants from vehicle leaks, maintenance, washing or accidents.

Recommendation:

- V The Department recommends the public water supplier consider nonstructural techniques such as street and parking lot sweeping which reduces the amount of potential contaminants in storm runoff. Work with the Town to have the catch basins on State Road inspected, maintained, and cleaned on a regular schedule.

6. **Presence of Oil Contamination Site within the IWPA** - The IWPA for Wells #1 contains DEP Tier Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number 40000591. Refer to the attached map and Appendix for more information.

Recommendation:

- V Monitor progress on any ongoing remedial action conducted for the known oil and/or Hazardous Material Release Site.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. Westport Investment Trust should review and adopt the **key recommendations** above and the following:

Zone I:

- V Keep non-water supply activities out of the Zone I.
- V Conduct regular inspections of the Zone I. Look for illegal dumping and evidence of vandalism.
- V If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.

Training and Education:

- V Drinking water protection signs were not observed during the SWAP site visit. Post drinking water protection area signs at key visibility locations.
- V Educate residents on proper application of pesticides and fertilizers.

Facilities Management:

- V Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html.

- V Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on facility property.
- V For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- V Work with local officials in Westport to include Westport Investment Trust's IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- V Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.

- V Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please note: each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact sheet
- Your Septic System Brochure
- Fertilizer Use Fact sheet
- Pesticide Use Fact sheet
- Wellhead Protection Grant Program Fact Sheet

5. Appendix - Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site-specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm> or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000591	851 State Road	Westport	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Westport Family Medicine

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Westport Family Medicine
<i>PWS Address</i>	829 Main Road
<i>City/Town</i>	Westport
<i>PWS ID Number</i>	4334083
<i>Local Contact</i>	Ann Cabral
<i>Phone Number</i>	(508) 636-5101

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

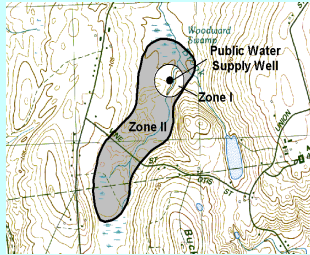
This report includes the following sections:

1. Description of the Water System
2. Discussion of Land Uses within the Protection Areas
3. Protection Recommendations
4. Appendices

Section 1: Description of the Water System

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

IWPA

Susceptibility: High

Well Names	Source IDs
Well No. 1	4334083-01G

1. Description of the Water System

The well for Westport Family Medicine Center is located west of Main Road. Well No. 1 has a Zone I radius of 100 feet and an Interim Wellhead Protection Area (IWPA) radius of 422 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I and IWPA.

The well serving the facility has no treatment at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses within the Protection Areas

There are land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Inappropriate Activities in Zone I;**
2. **Residential Land Uses;**
3. **Gasoline/Service Stations;**
4. **Underground Storage Tanks**
5. **Oil or Hazardous Material Contamination Sites**
6. **Landscaping**

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one moderate threat land use or activity in the IWPA, as seen in Table 2.

1. **Inappropriate Activities in Zone I** – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone Is. The facility's Zone I contains a portion of the facility building, a private home, parking areas, a road, and landscaped areas. The public water supplier does not own and/or control all land encompassed by the Zone I. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Remove all non-water supply activities from the Zone I to comply with

DEP's Zone I requirements.

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
 - ✓ Redirect road and parking lot drainage in the Zone I away from well.
2. **Residential Land Uses** –All of the residences have on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:
- ✓ **Septic Systems** - Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they can be a potential source of microbial contamination.
 - ✓ **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
 - ✓ **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
 - ✓ **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.
3. **Gasoline/Service Stations** – Gasoline stations typically have USTs for storage of the gasoline. Spills associated with tank fueling operations, vehicle overfills and leaking USTs are potential sources of groundwater contamination. See Appendix A for more information regarding gasoline/service stations located within the IWPA.
- Recommendations:**
- ✓ Encourage businesses to use BMP's for the storage, handling, and disposal of all hazardous chemicals, oils and waste oils.

- ✓ If these facilities have floor drains, ensure that the floor drains lead to a tight tank or municipal sewer as required by the plumbing code and Underground Injection Control Regulations, 310 CMR 27.00.

4. **Medical Facilities** – Medical facilities generate biological waste; use chemicals and generate chemical waste; and, may use radioactive material and generate low-level radioactive waste. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Medical Facilities Recommendations:

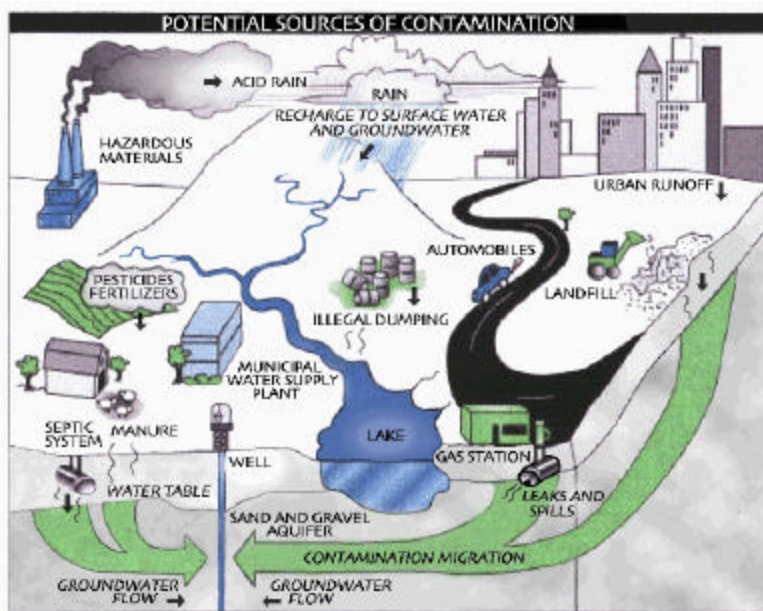
- ✓ Make certain that BMPs are in place for the storage, handling, and disposal of

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



- ✓ biological, chemical, and radioactive waste.
- ✓ Review Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Oil or Hazardous Material Contamination Sites – The IWPA contains or abuts two DEP Tier Classified Hazardous Material Release Site indicated on the map as Release Tracking Numbers 40013684 and 4-0013584. Refer to the attached map and Appendix B for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- 6. Landscaping** - Pesticides and fertilizers have the potential to contaminate a drinking water source if improperly stored, applied, or disposed.
- Recommendation:**
- ✓ Encourage businesses to use BMP’s for the storage, handling, and use of all pesticides, herbicides, and fertilizers.

Implementing the following recommendations will reduce the system’s susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells’ susceptibility to contamination. Westport Family Medicine Center is commended for having a formal Emergency Response Plan in place to deal with spills or other emergencies. Source protection recommendations are listed in Table 3, the Key Issues above and Appendix C. Westport Family Medicine Center should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.

Zone I:

- ✓ Conduct regular inspections of the Zone I.
- ✓ If Westport Family Medicine Center intends to continue utilizing the structures in the Zone I, use BMPs and restrict activities that could pose a threat to the water supply.
- ✓ If it’s not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that would prohibit potentially threatening activities or a right of first refusal to purchase the property.
- ✓ Frequently sweep and properly dispose of debris buildup on the parking lot and driveway.

(Continued on page 6)

What are “BMPs?”

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP’s Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

Source Protection Decreases Risk

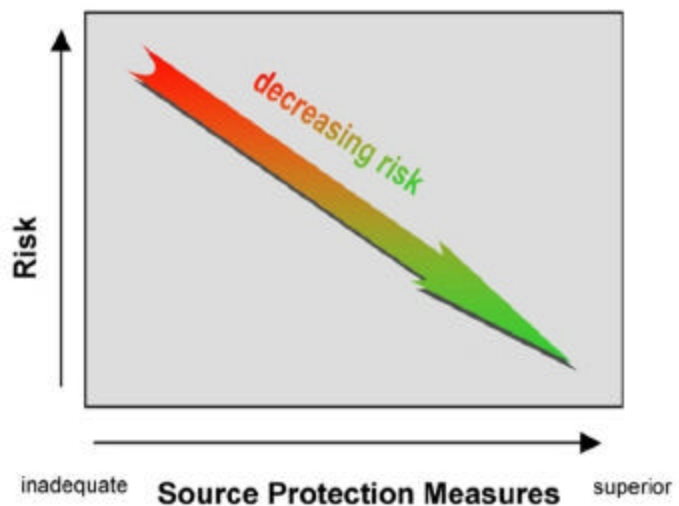


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zone I and IWPA)

For more information, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Potential Source of Contamination
Agricultural			
Landscaping	Numerous	Moderate	Fertilizers and pesticides: leaks, spills, improper handling, or over-application
Commercial			
Gas Stations/ Service Stations	2	High	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Medical Facility	1	Moderate	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage
Residential			
Fuel Oil Storage	Numerous	Moderate	Proper maintenance and upgrades to fuel oil tanks to prevent releases from occurring
Lawn Care / Gardening	Numerous	M	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	Numerous	M	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous			
Underground Storage Tanks	2 known	High	Spills, leaks, or improper handling
Small quantity hazardous waste generators	2	M	Hazardous materials and waste: spills, leaks, or improper handling or storage
Oil or Hazardous Material Sites	2	--	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Roads, Driveways and Parking Lots	Numerous	Moderate	Limit road salt usage and provide drainage away from wells

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix A: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix B: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

- ✓ Consider well relocation if Zone I threats cannot be mitigated.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include medical staff, custodial staff, and groundskeepers. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the well and is treated according to DEP guidance.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, refer to <http://www.state.ma.us/dep/bwp/dhm/files/sqgsum.pdf> for the Requirements for Small Quantity Generators.
- ✓ Floor drains in areas where hazardous materials or wastes might reach them need to drain to a tight tank, be sealed, or be connected to a sanitary sewer.
- ✓ Upgrade all oil storage tanks to incorporate proper containment and safety practices.
- ✓ Implement BMPs to ensure the proper handling and storage of hazardous materials.
- ✓ Implement BMPs for the use of fertilizer, herbicides and pesticides on the property.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.
- ✓ For utility transformers that may contain PCBs, contact the utility to determine if PCBs have been replaced. If PCBs are present, urge their immediate replacement. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.
- ✓ The facility is currently not registered as a generator of hazardous waste or waste oil. Review enclosed document "A Summary of Requirements for Small Quantity Generators of Hazardous Waste" to determine your status and

regulatory requirements.



Planning:

- ✓ Work with local officials in town to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. Please

note: each program year the Department posts a new Request for Response for

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	If it is not feasible to purchase the Zone I, consider a conservation restriction to prohibit potentially threatening activities and/or a right of first refusal to purchase.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	NO	Economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	NO	Daily inspections should be conducted in the Zone I.
Are water supply-related activities the only activities within the Zone I?	NO	Work toward the removal of all non-water supply activities from the Zone I.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town “Aquifer Protection District” bylaw meets DEP’s requirements for wellhead protection. Work with the Town to incorporate the IWPA within the Aquifer Protection District.
Do neighboring communities protect the Zone II areas extending into their communities?	YES	
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	
Does the Board of Health conduct inspections of commercial and industrial activities?	NO	For guidance see “Hazardous Materials Management: A Community's Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	NO	Notify town, commercial, and residential land users that they are within a drinking water protection area. Educate businesses on the use of BMPs to reduce contamination threats to the drinking water supply.

the Grant program (RFR). Other funding opportunities are described in “Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation” at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

Page 1 of 2

DEP Permitted Facilities:

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class
6842	Westport Highway Department	816 Main Road	Westport	Fuel Dispenser	Fuel Dispenser
131398	Westport Highway Department	820 Main Road	Westport	Generator of Hazardous Waste and Waste Oil	Small Quantity Generator

DEP Permitted Facilities:

Underground Storage Tanks:

Facility Name	Address	Town	Tank Material	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Cumberland Farms #3917	809 Main Road	Westport	reinforced fiberglass	double wall	interstitial monitoring	10,000	gasoline
			reinforced fiberglass	double wall	interstitial monitoring	10,000	gasoline

For more information on underground storage tanks, visit the Massachusetts Department of Fire Services web site: <http://www.state.ma.us/dfs/ust/ustHome.htm>

Notes: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

Appendix B: Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0013684	CUMBERLAND FARMS STORE #2028	WESTPORT	OIL
4-0013584	OLD WESTPORT TOWN GARAGE	WESTPORT	OIL

Cumberland Farms Store is located north of the facility, Old Westport Town Garage is located northeast of the facility.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Weymouth Water Division

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Weymouth Water Division
<i>PWS Address</i>	120 Winter Street
<i>City/Town</i>	Weymouth, Massachusetts
<i>PWS ID Number</i>	3336000
<i>Local Contact</i>	Bradley Hayes
<i>Phone Number</i>	(781) 337-5100
<i>Web Address</i>	www.weymouth.ma.us

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

Section 1: Description of the Water System

Groundwater Sources

Zone II #: 321

Source Name	Source ID#	Susceptibility
Circuit Ave. Well	3336000-01G	High
Main St. Well	3336000-02G	High
Libbey Park Well	3336000-03G	High
Winter St. Well #1	3206000-04G	High
Winter St. Well #2	3206000-05G	High

Surface Water Sources

Source Name	Source ID#	Susceptibility
Great Pond	3336000-01S	Moderate
Old Swamp River/South Cove	3336000-02S	High

The wells for the Weymouth Water Division are located within a single water supply protection area all within the Town of Weymouth. Each well has a Zone I radius of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barrier (i.e. confining clay layer) that can prevent contaminant migration. Please refer to the attached map of the Zone II.

The reservoirs for the Weymouth Water Division are located within two separate water supply protection areas, with a portion of the Great Pond water supply protection area extending into the towns of Abington, Braintree, and Holbrook, and a portion of the Old Swamp River/South Cove water supply protection area extending into the towns of Abington, Braintree, Hingham, and Rockland.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>

Section 2: Land Uses in the Protection Areas

The Zone II and Zone Cs for Weymouth are primarily a mixture of forest, and residential, with a small portion consisting of commercial and industrial land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Activities in Zone A
3. Hazardous Materials Storage and Use
4. Transportation Corridor
5. Department of Public Works facility
6. Residential Land Uses
7. Federal Superfund Site and Oil or Hazardous Material Contamination Sites
8. Comprehensive Wellhead Protection Planning

The ranking of susceptibility to contamination for the Zone II of the Circuit Avenue Well, Main Street Well, Libbey Park Well, Winter Street Well #1, and Winter St. Well #2 is high, based on the presence of at least one high threat land use within the water supply protection area, as seen in Table 2; the ranking of susceptibility to contamination for the Great Pond Zone Cs is moderate, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2; and, the ranking of susceptibility to contamination for Old Swamp River/South Cove is high, based on high threat land uses within the water supply protection area.

1. Activities in Zone I – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply activities such as homes and public roads. The following non-water supply activities occur in the Zone Is of the system wells:

Circuit Avenue Well - There are six homes, with all being on municipal sewer, and local roads in the Zone I.

Winter Street Well #1 - There is a portion of a house lot in the Zone I.

Winter Street Well #2 - There is a small portion of the DPW parking lot, a section of a commercial building with a known oil or hazardous material contamination site, and a portion of Winter Street in the Zone I.

Main Street Well - Route 3 (including an exit cloverleaf), and Route 18 intersect a significant portion of the Zone I.

Zone I Recommendations:

- ✓ To the extent possible, continue on-going efforts to remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Continue to use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I. In addition, continue to provide education materials to homeowners within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Agreement Options - Until land is available, continue to pursue options for a *Memorandum of Understanding* and *Right of First Refusal*.

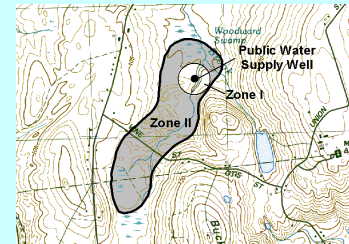
Memorandum of Understanding (MOU) is an agreement between the landowner and public water supplier in which the landowner agrees not to engage in specific threatening activities. The MOU should be specific to the land use or activity. For instance, if the land is residential with a septic system the owner could agree not to place chemicals, petroleum products, or other hazardous or toxic substances, including septic system cleaners into the septic system, and that the system will be pumped at a specific frequency. The application of lawn care chemicals could also be restricted. Understanding how and activity threatens drinking water quality is an important component of developing an effective MOU.

Right of First Refusal is a legal document that gives the water supplier first chance to purchase land when it becomes available. See *Right of First Refusal* in Appendices.

2. Activities in Zone A - Existing and future land use activities which may have an impact on surface water sources include: on-site septic systems; public and private recreational activities; untreated stormwater runoff; uncontained storage of fertilizers, manure, domestic animals; new construction; spills along roads; above ground and underground storage tanks; erosion; and un-permitted and unauthorized activities.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.

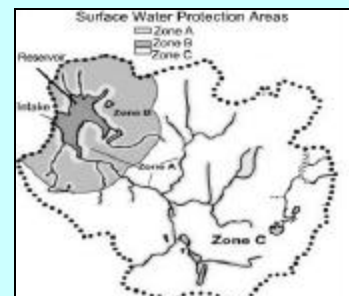


What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.



Wild animals, farm animals, and domestic pets can be carriers of waterborne diseases such as Giardia, Cryptosporidium, Salmonella, etc. The following non-water supply activities occur in the Zone A of the system's reservoirs:

Great Pond - Numerous homes exist throughout the Zone A of the reservoir and its tributaries, some of which are on private septic systems; local roads run throughout the Zone A of the reservoir and its tributaries, with Route 3 and Route 18 crossing sections of the northern tributary; and, there is a small amount of commercial activity occurring in the Zone A of the northern tributary to the reservoir.

South Cove - There are numerous homes, some of which are on private septic systems throughout the Zone A of the reservoir and tributaries to the reservoir; four underground storage tanks are in the Zone A of the reservoir and its tributaries; and, Route 53, Route 3, Route 18, and local roads run throughout the Zone A of the reservoir and tributaries;

Zone A Recommendations:

- ✓ To the extent possible, continue on-going efforts to remove all non-water supply activities from the Zone As to comply with DEP's Zone A requirements.

- ✓ Continue to use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Storage of pesticides, fertilizers or road salt within the Zone A should be covered and contained.
- ✓ To the extent possible, continue to keep any new prohibited activities out of the Zone A.

3. Hazardous Materials Storage and Use – Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Continue to educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil.

(Continued on page 7)

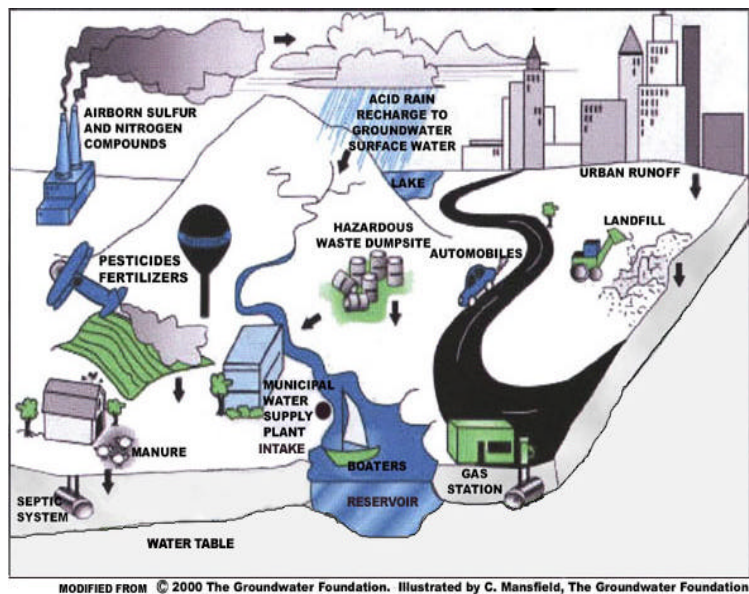


Figure 1: Sample watershed with examples of potential sources of contamination

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II Number	Zone C Source ID	Potential Contaminant Sources*
Commercial					
Gas Stations	9	H		01S, 02S	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Cemeteries	1	M		01S	Leaks, spills, improper handling, or over-application of pesticides; historic embalming fluids
Funeral Homes	1	L		02S	Spills, leaks, or improper handling of hazardous chemicals
Medical Facilities	2	M		02S	Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes
Railroad Tracks and Yards	2	H		02S	Over-application or improper handling of herbicides, leaks or spills of transported chemicals and maintenance chemicals; fuel storage
Industrial					
Fuel Oil Distributors	1	H		02S	Spills, leaks, or improper handling or storage of fuel oil
Industry/Industrial Parks	2	H	321	02S	Spills, leaks, or improper handling or storage of industrial chemicals and metals
Residential					
Fuel Oil Storage (at residences)	Numerous	M	321	01S, 02S	Spills, leaks, or improper handling of fuel oil
Lawn Care/Gardening	Numerous	M	321	01S, 02S	Over-application or improper storage and disposal of pesticides
Septic Systems/Cesspools	Numerous	M	321	01S, 02S	Microbial contaminants, and improper disposal of hazardous chemicals
Miscellaneous					
Aboveground Storage Tanks	6	M		01S, 02S	Spills, leaks, or improper handling of materials stored in tanks
Fishing/Boating	Numerous	L		02S	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste Generators	4	H		02S	Spills, leaks, or improper handling or storage of hazardous materials and waste

Land Uses	Quantity	Threat	Zone II Number	Zone C Source ID	Potential Contaminant Sources*
Miscellaneous					
Military Facilities (Past And Present) Type: <u>Naval Air</u>	1	H		02S	Spills, leaks, or improper handling or storage of pesticides and herbicides, fuel, chemicals and other materials; may include ordnance or waste landfill/ dump sites
Oil or Hazardous Material Sites	15	--	321	01S, 02S	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road And Maintenance Depots	1	M	321	02S	Spills, leaks, or improper handling or storage of deicing materials, automotive fluids, fuel storage, and other chemicals
Schools, Colleges, and Universities	5	M	321	01S, 02S	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small quantity hazardous waste generators	18	M	321	02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/ Retention Basins	Multiple	L	321	01S, 02S	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Superfund Sites	1	H		02S	Spills, leaks, or improper handling or storage of oil or hazardous materials and waste
Transmission Line Rights-of-Way Type: <u>electric</u>	2	L		01S, 02S	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	2	M	321	02S	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	42	H	321	01S, 02S	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generator	3	L	321	02S	Spills, leaks, or improper handling or storage of hazardous materials and waste
Water Treatment Sludge Lagoon	4	M		01S	Improper management of sludge and wastewater
Notes: <ol style="list-style-type: none"> When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites. <ul style="list-style-type: none"> THREAT RANKING - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater. 					

Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Continue to enforcement of existing Hazardous Materials Storage and Use Ordinance.
- ✓ Continue to educate local businesses on Massachusetts floordrain requirements. See brochure "Industrial Floor Drains" for more information.

4. Transportation Corridors - Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catch basins.

Transportation Corridor Recommendations:

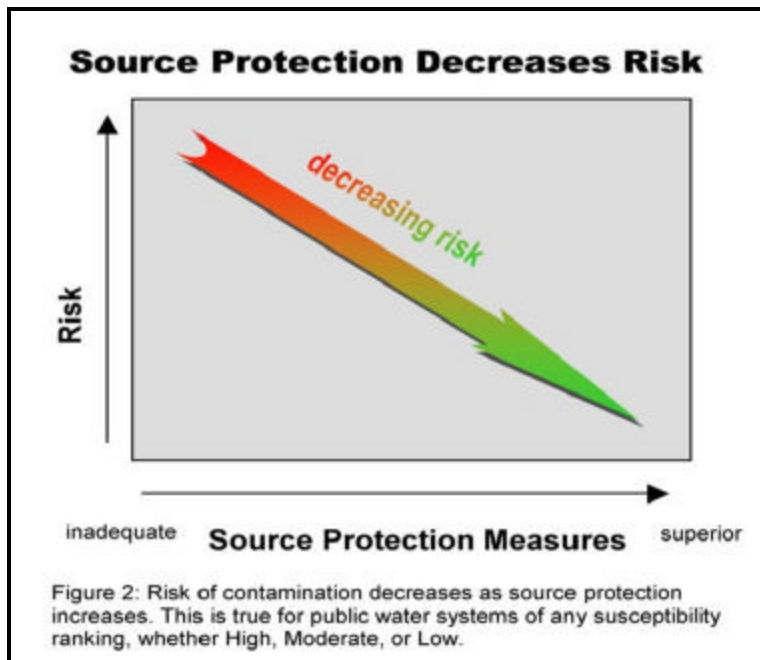
- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone II and Zone Cs.

- ✓ Continue to work with the Town DPW and State to inspect, maintain, and clean catch basins on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Continue to work with the Town DPW and State emergency response teams to ensure that any spills within the Zone II, Zone A and Zone C can be effectively contained.
- ✓ After identifying and mapping stormdrains as part of the EPA Phase II Stormwater Rule, review the maps with emergency response teams.

5. Department of Public Works Facility - The potential for ground water contamination in municipal facilities is related to accidental dumps, accidental spills, and vehicle washing operations, or from wastewater treatment or left over product. Waste management and product storage processes pose the most prevalent threats to ground water, and a wide variety of potentially harmful constituents are involved in release incidents.

Department of Public Works Facility Recommendations:

- ✓ **Best Management Practices** - The New England Environmental Assistance Team provides municipalities in New England with information on how to comply with environmental requirements, and how to prevent pollution. For more information about this EPA sponsored program visit their website at <http://www.epa.gov/region1/steward/neeat/muni/index.html>.



Encourage the Department of Public Works to develop best management practices to insure proper salt storage, proper maintenance of facilities and good housekeeping practices.

✓ **Fuel Dispensing Area**

- Continue to maintain fuel-dispensing areas using dry cleanup methods. Fueling areas should never be washed down unless dry clean-up has been done and the wash water is collected and disposed of in the sanitary sewer system.
- Post signs against "topping off" of vehicle fuel tanks.
- The fuel dispensing area should be covered, and the cover must not drain onto the fuel dispensing area.
- The paving around the fuel dispensing area should exceed the minimum dimensions of the "fuel dispensing area", and should have a means for containing accidental spills.

✓ **Salt Storage Structure** - Salt pile structures should be adequately sized to allow for the loading and unloading of salt within the structure. Review the Department of Environmental Protection's Drinking Water Program Guidelines On Deicing Chemical (Road Salt) Storage at <http://www.state.ma.us/dep/brp/dws/files/saltgui.doc>.

6. Residential Land Uses – Approximately 30% of the combined Zone II and Zone Cs consist of residential areas. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Continue to educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Continue to work with planners to control new residential developments in the water supply protection areas.
- ✓ Continue to promote BMPs for stormwater management and pollution controls.

7. Presence of Federal Superfund Site and Oil or Hazardous Material Contamination Sites – The Zone C for South Cove contains a United States Environmental Protection Agency (USEPA) Superfund Site that is associated with DEP Tier Classified Oil and/or Hazardous Material Release Sites listed on DEP's Sites Database as Release Tracking Numbers 3-0002621, 3-0010239, 3-0010469, 3-0010628, 3-0010739, 3-0010858, 3-0011622, and 3-0013157. The Zone II and Zone Cs also contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the maps as Release Tracking Numbers 3-0000036, 3-0000148, 3-0000331, 3-0003287, 3-0003304, 3-0003728, 3-0004480, 3-0004750, 3-0010268, 3-0017307, 3-0017359, 3-0017906, 3-0017927, 3-0019210, and 4-0006043. Refer to the attached map and Appendix C for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Continue to monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

8. Protection Planning – Currently, the Town is in the process of updating water supply protection controls to meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead and Watershed Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead and Watershed Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan” and “Developing a Local Surface Water Supply Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead and watershed protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21(2), and MA Surface Water Supply Protection Regulations 310 CMR 22.20B and 310 CMR 22.20C. If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2), 310 CMR 22.20B and 310 CMR 22.20C. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).

Other land uses and activities within the Zone II and Zone Cs that are potential sources of contamination are included in Table 2.

Refer to Appendix B for more information about these land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth

information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone II and Zone C’s contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Adoption and enforcement of local Hazardous Materials Storage and Use Ordinance
- Working closely with MWRA TRAC department regarding hazardous materials in the Weymouth sewer system
- Adopting a “No Salt Zone” policy for the application of road salt within Zone A and Zone I
- Identifying and mapping storm drains draining into the watershed as part of the EPA Phase II Stormwater Rule
- Redirecting drainage from DPW yard to outside of the Zone II
- Completing self-audit of DPW facility as part of EPA audit program
- Working with the Weymouth Highway Department to redirect the Washington Street stormdrains that flow into South Cove to Whitman’s Pond.
- Inventory, mapping, inspecting, and cleaning stormdrains.

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.

**Top 5 Reasons to
Develop a Local Wellhead
and Surface Water
Protection Plan**

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	YES (Libbey Park Well)	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
	NO (Great Pond, South Cove, Circuit Ave. Well, Main Street Well, Winter Street Well #1, Winter Street Well #2)	To the extent possible, remove non-water supply activities from each Zone I and prohibited activities in Zone A to comply with DEP's Zone I and Zone A requirements. Investigate options for gaining ownership or control of the Zone I for groundwater sources.
Are the Zone 1 and Zone A posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone 1 and Zone A regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I and Zone A?	YES (Libbey Park Well)	Continue monitoring for non-water supply activities in Zone As.
	NO (Great Pond, South Cove, Circuit Ave. Well, Main Street Well, Winter Street Well #1, Winter Street Well #2)	Monitor non-water supply activities in Zone I and prohibited activities in Zone A, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C and Wellhead Protection Controls that meet 310 CMR 22.21(2)	NO	Work with the Planning Board and the Board of Selectmen to adopt land use controls that meet 310 CMR 22.21(2) and 310 CMR 22.20C. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	Uncertain	Request that municipal officials in Abington, Braintree, Hingham, Holbrook, and Rockland develop land use restrictions that meet 310 CMR 22.21(2) and 310 CMR 22.20C, and to incorporate Weymouth's source protection areas.
Planning		
Does the PWS have a local surface water and wellhead protection plan?	NO	Develop a surface water supply protection plan. Follow "Developing a Local Surface Water Supply Protection Plan" available at: www.state.ma.us/dep/brp/dws/ . Develop a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement the plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed and wellhead protection committee?	YES	Reconvene committee; include representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	Board of Health has a Hazardous Materials Bylaw. For additional guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	YES	Currently, the only outreach is through the annual Consumer Confidence Report, flyers, and bill stuffers. Increase residential outreach through school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial, industrial and municipal uses within the Zone II and Zone Cs.

- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above, and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Protection Recommendations
- B. Regulated Facilities within the Water Supply Protection Area
- C. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- D. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

For More Information

Contact Anita Wolovick in DEP's Wilmington Office at (978) 661-7768 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier and town boards.

APPENDIX A: DEP PERMITTED FACILITIES WITHIN WEYMOUTH'S WATER SUPPLY PROTECTION AREAS

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
326677	AMES DEPARTMENT STORE	140 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
31927	BOBS COLLISION	185 LIBERTY STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR
223383	CAMERONS GULF SERVICE	4 HOLLIS STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
223383	CAMERONS MOBIL SERVICE	4 HOLLIS STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
223383	CAMERONS MOBIL SERVICE	4 HOLLIS STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
317273	CAPITAL PAPER RECYCLING	200 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
359014	CAPITAL PAPER RECYCLING INC	200 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
363630	CELTIC COLLISION INC	77 PLEASANT STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
136138	CUMBERLAND GULF #60436	237 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
136491	CUMBERLAND GULF 118610	767 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
205716	DELUZE COLLISION CENTER	84 LIBERTY STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR
365069	EGG & G INC	150-152 UNION STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
132645	FISHER PIERCE	90 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR
132645	FISHER PIERCE	90 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
217386	FIT TO PRINT INC	106 FINNELL DRIVE	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
35761	GERBRANDS JACK MASS TIRE INC	76 POND STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
209568	GETTY 30315	522 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
210060	GETTY 30363	469 WASHINGTON STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
337174	GOOD BROTHERS DODGE	577 COLUMBIAN STREET	WEYMOUTH	HANDLER	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
36553	HOLLIS ALVIN & CO	1 HOLLIS STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR
28417	JANNELL MOTORS INC	1068 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
126806	KEVEN ROONEY INC	686 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
356542	KHOURYS GAS INC	565 BROAD STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
365067	M & S AUTO	150 UNION STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
28987	MASS ELECTRIC COMPANY	186 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
28987	MASSACHUSETTS ELECTRIC COMPANY	186 MAIN STREET	WEYMOUTH	HANDLER	LARGE QUANTITY GENERATOR
28987	MASSACHUSETTS ELECTRIC COMPANY	186 MAIN STREET	WEYMOUTH	HANDLER	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
130918	MATHEWSON CORP	86 FINNELL DRIVE	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
130918	MATHEWSON CORP	86 FINNELL DRIVE	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
367682	MINAS AUTO REPAIR	150 UNION STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
178140	MOBIL OIL CORP SS 754	512 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
178140	MOBIL OIL CORP SS 754	512 MAIN STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
132012	SMITH RICKY PONTIAC INC	25 MAIN STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR
132643	SOUTH SHORE HOSPITAL	55 FOGG ROAD	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR
126807	SOUTH WEYMOUTH SERVICE	512 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
332267	SOUTHEASTERN METAL FAB	195 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
332267	SOUTHEASTERN METAL FAB	195 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
31873	SPEEDY MUFFLER KING	254 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
136141	SUNOCO SERVICE STATION	995 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
357180	SUNSET AUTOMOTIVE SERVICE INC	195 PARK AVENUE WEST	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
356530	SUPER PETROLEUM INC	150-152 UNION STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
363451	SUPER PETROLEUM INC	995 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
285876	SUPERSHINE CAR WASH CITGO	1068 MAIN STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
205600	SURE GO TRANSMISSIONS	866 WASHINGTON STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
210011	THS AUTO SERVICE	325 RALPH TALBOT STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
210011	THS AUTO SERVICE CITGO	325 RALPH TALBOT STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
32417	UNLIMITED AUTO SERVICE INC	77 PLEASANT STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
52483	US NAVAL AIR STATION	1134 MAIN STREET - CODE 01E	WEYMOUTH	PLANT	RES APPLICATION APPROVED
297186	WALGREENS 2709	969 MAIN STREET	WEYMOUTH	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
115675	WALLY'S PRINT INC	86 POND STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
132924	WEYMOUTH DEPARTMENT OF PUBLIC WORKS	120 WINTER STREET	WEYMOUTH	DISCHARGE	MWRA SEWER CONNECTION
364223	WEYMOUTH DPW	120 WINTER STREET	WEYMOUTH	FUEL DISPENDER	FUEL DISPENSER
30201	WEYMOUTH HONDA	211 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
30201	WEYMOUTH HONDA	211 MAIN STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
30201	WEYMOUTH HONDA	211 MAIN STREET	WEYMOUTH	HANDLER	LARGE QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
338860	WEYMOUTH MRI	420 LIBBY INDUSTRIAL PARKWAY	WEYMOUTH	DISCHARGE	MWRA SEWER CONNECTION
317014	WEYMOUTH RENTALS INC	1059 WASHINGTON STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR
317014	WEYMOUTH RENTALS INC	1059 WASHINGTON STREET	WEYMOUTH	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
35427	CAR CRAFT AUTO BODY INC	521 GROVE STREET	BRAINTREE	HANDLER	VERY SMALL QUANTITY GENERATOR
37640	DICKINSON BECTON IMMUNOCYTOMETRY	60 COLUMBIAN STREET	BRAINTREE	HANDLER	VERY SMALL QUANTITY GENERATOR
215559	ALCATEL VACUUM PRODUCTS	67 SHARP STREET	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR
215559	ALCATEL VACUUM PRODUCTS	67 SHARP STREET	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
228845	B E PETERSON INC	75 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
228845	B E PETERSON INC	75 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
331316	BYRNE INDUSTRIES INC	70 SHARP STREET	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
265813	CJM CONSTRUCTION	85 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
32260	CRANE JOHN INC	4 KEITH WAY	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
334498	ELDRED WHEELER	60 SHARP STREET	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
229557	HENNIGAN ENGINEERING	55 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
324878	JM PERRONE CO INC	105 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
324878	JM PERRONE CO INC	105 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
29880	MACKENZIE MACHINE AND DESIGN INC	10 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
332074	NATIONAL OFFSET BLANKET SUPPLY INC	41 SHARP STREET	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
34301	NE SEALCOATING CO INC	120 INDUSTRIAL PK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
34301	NE SEALCOATING CO INC	120 INDUSTRIAL PK ROAD	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
229008	NICHOLOSON CONSTRUCTION CO	85 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
115388	PREMCO INC	55 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
115388	PREMCO INC	55 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY

DEP FACILITY NUMBER	FACILITY NAME	STREET ADDRESS	TOWN	PERMITTED ACTIVITY	ACTIVITY CLASS
228847	RISO PRODUCTS	15 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
230021	RJL PRINTING INC	65 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
52481	RUSS ELECTRIC INC	99 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	LARGE QUANTITY GENERATOR
52481	RUSS ELECTRIC INC	99 INDUSTRIAL PARK ROAD	HINGHAM	TURRPT	LARGE QUANTITY TOXIC USER
228857	SATUIT SWISS	15 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
228857	SATUIT SWISS	15 INDUSTRIAL PARK ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
331318	TRICORE INC	100 SHARP STREET	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
26733	US REPEATING ARMS CO INC	100 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
26733	US REPEATING ARMS CO INC	100 RESEARCH ROAD	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
228851	VIP CLEANERS	95 RESEARCH ROAD	HINGHAM	HANDLER	VERY SMALL QUANTITY GENERATOR
130011	VULCAN CO INC THE	51 SHARP STREET	HINGHAM	HANDLER	SMALL QUANTITY GENERATOR - WASTE OIL/PCBS ONLY
28888	READ SAND & GRAVEL INC	171 V F W DRIVE	ROCKLAND	HANDLER	VERY SMALL QUANTITY GENERATOR
28888	READ SAND & GRAVEL INC	171 V F W DRIVE	ROCKLAND	HANDLER	RECYCLER - BURNER/BLENDER

UNDERGROUND STORAGE TANKS WITHIN WEYMOUTH'S WATER SUPPLY PROTECTION AREAS

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
ALVIN HOLLIS & CO	100 POND STREET	WEYMOUTH	PETROLEUM DISTRIBUTOR	3000	DIESEL
CAMERONS MOBIL SERVICE	4 HOLLIS STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
CAMERONS MOBIL SERVICE	4 HOLLIS STREET	WEYMOUTH	GAS STATION	8000	GASOLINE
CAMERONS MOBIL SERVICE	4 HOLLIS STREET	WEYMOUTH	GAS STATION	8000	GASOLINE
CUMBERLAND GULF	767 MAIN STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
CUMBERLAND GULF	767 MAIN STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
CUMBERLAND GULF	767 MAIN STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
CUMBERLAND GULF	767 MAIN STREET	WEYMOUTH	GAS STATION	550	WASTE OIL
CUMBERLAND GULF	237 MAIN STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
CUMBERLAND GULF	237 MAIN STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
CUMBERLAND GULF	237 MAIN STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
CUMBERLAND GULF	237 MAIN STREET	WEYMOUTH	GAS STATION	4000	GASOLINE
EG & G	150-152 UNION STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
EG & G	150-152 UNION STREET	WEYMOUTH	GAS STATION	5000	GASOLINE
GETTY STATION	522 MAIN STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
GETTY STATION	522 MAIN STREET	WEYMOUTH	GAS STATION	8000	GASOLINE

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
GETTY STATION	522 MAIN STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
GETTY STATION	469 WASHINGTON STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
GETTY STATION	469 WASHINGTON STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
GETTY STATION	469 WASHINGTON STREET	WEYMOUTH	GAS STATION	550	WASTE OIL
MASS ELECTRIC	186 MAIN STREET	WEYMOUTH	UTILITIES	10000	GASOLINE
MASS ELECTRIC	186 MAIN STREET	WEYMOUTH	UTILITIES	10000	DIESEL
MOBIL	512 MAIN STREET	WEYMOUTH	GAS STATION	12000	GASOLINE
MOBIL	512 MAIN STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
MOBIL	512 MAIN STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
MOBIL	512 MAIN STREET	WEYMOUTH	GAS STATION	1000	WASTE OIL
ROONEY'S	686 MAIN STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
ROONEY'S	686 MAIN STREET	WEYMOUTH	GAS STATION	5000	GASOLINE
ROONEY'S	686 MAIN STREET	WEYMOUTH	GAS STATION	4000	GASOLINE
ROONEY'S	686 MAIN STREET	WEYMOUTH	GAS STATION	1000	DIESEL
ROUTE 18 TEXACO	995 MAIN STREET	WEYMOUTH	GAS STATION	8000	GASOLINE
ROUTE 18 TEXACO	995 MAIN STREET	WEYMOUTH	GAS STATION	8000	GASOLINE

FACILITY NAME	ADDRESS	TOWN	DESCRIPTION	CAPACITY (GAL)	CONTENTS
ROUTE 18 TEXACO	995 MAIN STREET	WEYMOUTH	GAS STATION	8000	GASOLINE
SOUTH WEYMOUTH CITGO	1068 MAIN STREET	WEYMOUTH	GAS STATION	12000	GASOLINE
SOUTH WEYMOUTH CITGO	1068 MAIN STREET	WEYMOUTH	GAS STATION	12000	GASOLINE
SUNSET SERVICE STATION	195 PARK AVENUE WEST	WEYMOUTH	GAS STATION	6000	GASOLINE
SUNSET SERVICE STATION	195 PARK AVENUE WEST	WEYMOUTH	GAS STATION	6000	GASOLINE
SUNSET SERVICE STATION	195 PARK AVENUE WEST	WEYMOUTH	GAS STATION	4000	GASOLINE
THS CITGO	325 RALPH TALBOT STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
THS CITGO	325 RALPH TALBOT STREET	WEYMOUTH	GAS STATION	10000	GASOLINE
THS CITGO	325 RALPH TALBOT STREET	WEYMOUTH	GAS STATION	6000	GASOLINE
WEYMOUTH DEPARTMENT OF PUBLIC WORKS	120 WINTER STREET	WEYMOUTH	MUNICIPAL	10000	GASOLINE

For more information on underground storage tanks, visit the Massachusetts department of fire services web site: <http://www.state.ma.us/dfs/ust/usthome.htm>

Note: this appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities located within the water supply protection area(s) should be considered in local drinking water source protection planning.

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within Weymouth’s Water Supply Protection Areas

DEP’s datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP’s Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP’s Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state’s OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitellst.htm> or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
3-0004480	237 Main Street	Weymouth	Oil
3-0003287	60 Winter Street	Weymouth	Oil
3-0003304	512 Main Street	Weymouth	Oil and Hazardous Material
3-0017906	325 Ralph Talbot Street	Weymouth	Oil
3-0017927	55 To 111 Central Street	Weymouth	Oil
3-0019210	24 Burton Terrace	Weymouth	Oil
3-0003728	747 Front Street	Weymouth	--
3-0000148	325 Ralph Talbot Street	Weymouth	--
3-0004750	55 Hollis Street	Weymouth	Oil
3-0000036	686 Main Street	Weymouth	--
4-0010268	118 Thicket Street	Abington	Oil
3-0000331	100 Industrial Park Road	Hingham	Oil
3-0017359	100 Research Road	Hingham	Oil
3-0017307	100 Research Road	Hingham	Oil
4-0006043	163 Forest Street	Rockland	--

For more location information, please see the attached map. The map lists the release sites by Release Tracking Number (RTN).



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Eliot Woods Condominiums

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
November 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Eliot Woods Condominiums
PWS Address	728 Auburn Street
City/Town	Whitman, MA 02382
PWS ID Number	4338002
Local Contact	John O'Conner
Phone Number	(617) 984-1658

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well #1	01G	267	688	Moderate
Well #2	02G	267	688	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Eliot Woods Condominiums receives its drinking water from two 6-inch bedrock wells located in a forested area southwest of the condominium complex. Both wells have Zone I radii of 267 feet and Interim Wellhead Protection Areas (IWPA) of 688 feet. The IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the wells may be significantly larger or smaller than the IWPA. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone Is and IWPAs. Currently the water is treated with a water softener to control iron and manganese. The DEP requires public water suppliers to monitor the quality of the water. For current information on

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

2. Discussion of Land Uses in the Protection Areas

There are a number of land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Zone Is;**
2. **Residential development; and**
3. **Transmission line.**

The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of moderate threats within the IWPA.

1. **Zone Is** – Currently, the well meets DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The Zone Is are owned by the Eliot Woods Condominium Trust and there are no non-water supply activities in the Zone Is. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Do not allow any non-water supply activities in the Zone Is.
- ✓ Never use or store pesticides, fertilizers or road salt within the Zone Is.

2. **Residential Development** – Some of the condominiums, landscaping and vehicle parking are located in the IWPA. Activities associated with residential development have the potential to impact drinking water quality if improperly managed.

Recommendation:

- ✓ If possible, contact residents in the IWPA about water supply protection. A brochure is included in this packet.
- ✓ Direct stormwater drainage in vehicle parking areas away from Zone Is and IWPAs

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Residential development	No	Yes	Moderate	Runoff from lawns, septic systems, underground/above ground storage tanks
Parking lot	No	Yes	Moderate	Stormwater runoff, spills
Lawn	No	Yes	Moderate	Fertilizer and pesticide use
Heating oil storage	No	Yes	Moderate	Leaks, spills
Transmission Line	No	Yes	Moderate	Application of herbicides

* For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

when possible.

- ✓ Minimize use of pesticides and fertilizers in IWPA's.
 - ✓ Ensure that heating oil is properly stored and contained to prevent release in case of a spill.
 - ✓ Ensure that heating oil deliveries are supervised to prevent spillage from over filling or other accidents.
3. **Transmission Line Right of Way within the IWPA** – A transmission line right of way crosses the IWPA. Over-application or improper handling of herbicides used for clearing the right-of-way is a potential source of contamination.
- Recommendation:**
- ✓ Contact the utility company to ensure that pesticides and herbicides are not sprayed in the IWPA of the Eliot Woods Condominium water supply.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. The Eliot Woods Condominium is commended for protection the Wells' Zone Is as wooded conservation land. The Condominium Trust should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

- ✓ Keep non-water supply activities out of the Zone Is.
- ✓ Post water supply protections signs in the Zone Is and IWPA's.
- ✓ Conduct regular inspections of the Zone Is. Look for illegal dumping or evidence of vandalism.
- ✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
- ✓ Keep road and parking lot drainage away from the wells.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Training and Education:

- ✓ Train staff and residents on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Post drinking water protection area signs at key visibility locations.

Facilities Management:

- ✓ Inspect and maintain the integrity of fuel oil storage and associated containment structures.
- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in town to include the facility's IWPA in the Aquifer Protection District Bylaw and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational

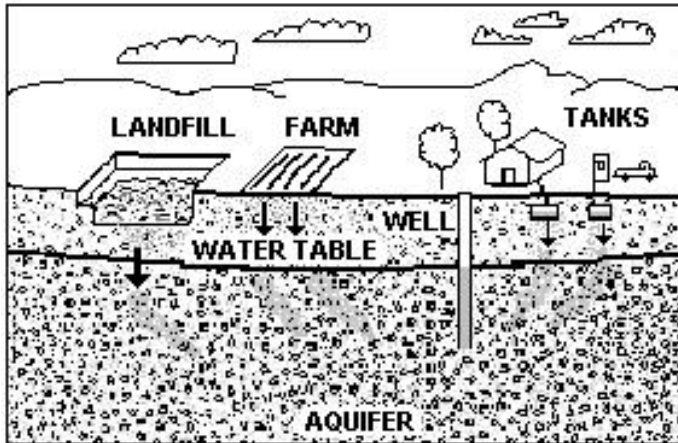


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under that program. For additional information, please refer to DEP's web site. Other funding opportunities are described in *Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation* at <http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf>.

Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

3. Attachments

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Residents Protect Drinking Water Factsheet
- Your Septic System Brochure
- Source Protection Sign Order Form

Copies of this assessment have been made available to the public water supplier and town boards.



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Wrentham Water Division

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Wrentham Water Division
<i>PWS Address</i>	360 Taunton Street
<i>City/Town</i>	Wrentham, Massachusetts
<i>PWS ID Number</i>	4350000
<i>Local Contact</i>	John Manchester
<i>Phone Number</i>	(508) 384-5477

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

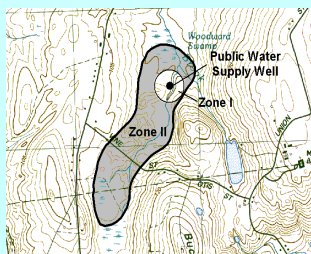
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 178

Susceptibility: High

Well Names	Source IDs
Franklin Street Well #2	4350000-03G
Franklin Street Well #3	4350000-04G

Zone II #: 179

Susceptibility: High

Well Name	Source ID
Thurston Street Well #4	4350000-02G

The Wrentham Water Division uses three wells to supply drinking water to its customers. Franklin Street Wells #2 and #3 are located to the north of Lake Pearl in one Zone II. The other well, Thurston Street Well #4, is located in a separate Zone II in the eastern part of Wrentham near Rt. 1. Each well has a Zone I of 400 feet. The wells are located in aquifers with high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and Zone IIs.

All three wells have potassium hydroxide added for corrosion control, and the Thurston Street Well #4 is treated with a disinfectant. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone IIs for Wrentham are predominantly forest and residential with small percentages of commercial, and light industrial, land uses (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Inappropriate activities in Zone I
2. Residential land uses
3. Transportation corridors
4. Hazardous materials storage and use
5. Oil or hazardous material contamination sites
6. Comprehensive wellhead protection planning

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2.

1. Inappropriate Activities in Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water

supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non water supply activities such as homes and public roads. The following non water supply activities occur in the Zone Is of the system wells:

Zone I: Franklin Street Wells #2 and #3 (4350000-03G & 4350000-03G):

The Zone Is for the Franklin Street Wells do not meet DEP's Zone regulations because not all of the area in the Zone Is is owned or controlled by the Town. The Zone Is contain private residences and a portion of Route 140.

Zone I: Thurston Street Well #4 (4350000-02G): The Zone I for the Thurston Street Well complies with all of DEP's Zone I regulations, it is owned by the town of Wrentham and only water supply activities occur there.

Zone I Recommendations:

- ✓ To the extent possible, remove all non water supply activities from the Zone I to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.
- ✓ Educate residents located in the Franklin Street Wells' Zone Is of their potential impacts on the wells.

2. Residential Land Uses – Approximately 30% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products

used in homes are potential sources of contamination.

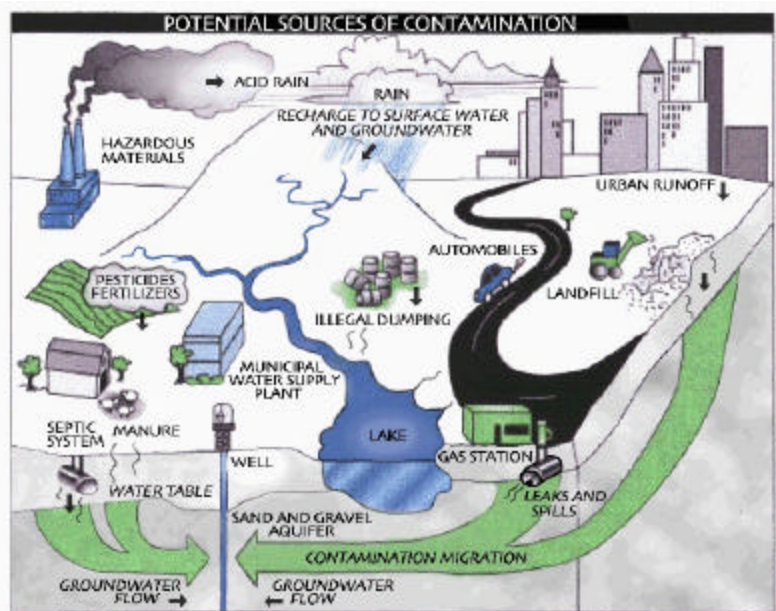
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.



Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

3. Transportation Corridors - Routes 140 and 1A intersect both Zone IIs and Route 495 runs through the southern part of the Zone II for the Franklin Street Wells. Local roads are common throughout the Zone IIs. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors. Wherever possible, ensure that drains discharge stormwater outside of the Zone Is and if possible, outside of the Zone IIs.
- ✓ Work with the Town and State to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

For More Information

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

4. Hazardous Materials Storage and Use –

About five percent of the land area within the Zone II is used for commercial or industrial land uses. Many small businesses and industries use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in UST/AST. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on best management practices for protecting water supplies. Distribute the fact sheet “Businesses Protect Drinking Water” available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMP's for common business issues.
- ✓ Work with local businesses to register those

(Continued on page 7)

Source Protection Decreases Risk

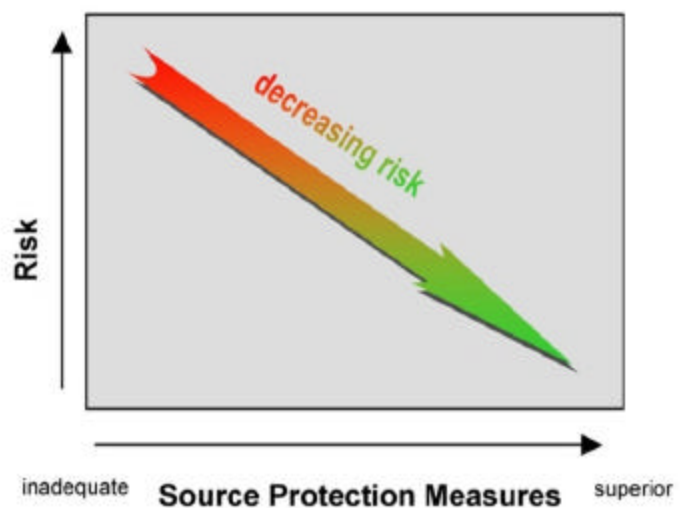


Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Agricultural				
Nurseries	1	M	178	Fertilizers, pesticides, and other chemicals: leaks, spills, improper handling, or over-application
Commercial				
Gas Stations	3	H	178	Automotive fluids and fuels: spills, leaks, or improper handling or storage
Cemeteries	1	M	179	Over-application of pesticides: leaks, spills, improper handling; historic embalming fluids
Dry Cleaners	2	H	178 & 179	Solvents and wastes: spills, leaks, or improper handling
Funeral Homes	1	L	178	Hazardous chemicals: spills, leaks, or improper handling
Golf Courses	1	M	178	Fertilizers or pesticides: over-application or improper handling
Medical Facilities	2	M	178 & 179	Biological, chemical, and radioactive wastes: spills, leaks, or improper handling or storage (Doctor's Offices)
Repair Shops (Engine, Appliances, Etc.)	1	H	178	Engine fluids, lubricants, and solvents: spills, leaks, or improper handling or storage
Residential				
Fuel Oil Storage (at residences)	many	M	178 & 179	Fuel oil: spills, leaks, or improper handling
Lawn Care / Gardening	many	M	178 & 179	Pesticides: over-application or improper storage and disposal
Septic Systems / Cesspools	many	M	178 & 179	Hazardous chemicals: microbial contaminants, and improper disposal
Miscellaneous				
Composting Facilities	1	L	178	Organic material, animal waste, and runoff: storage and improper handling (DPW)

Table 2 Continued: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Activities	Quantity	Threat*	Zone II #	Potential Source of Contamination
Miscellaneous—Continued				
Fishing/Boating	Few	L	178	Fuel and other chemical spills, microbial contaminants
Landfills and Dumps	1	H	179	Seepage of leachate (Closed and Capped)
Oil or Hazardous Material Sites	7	--	178 (6) 179 (1)	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Road And Maintenance Depots	1	M	178	Deicing materials, automotive fluids, fuel storage, and other chemicals: spills, leaks, or improper handling or storage
Schools, Colleges, and Universities	1	M	178	Fuel oil, laboratory, art, photographic, machine shop, and other chemicals: spills, leaks, or improper handling or storage (High School)
Small quantity hazardous waste generators	4	M	178	Hazardous materials and waste: spills, leaks, or improper handling or storage
Very Small Quantity Hazardous Waste Generator	2	L	178	Hazardous materials and waste: spills, leaks, or improper handling or storage
Tire Dumps	1	M	179	Tires: improper handling or management
Transportation Corridors	several	M	178 & 179	Fuels and other hazardous materials: accidental leaks or spills; pesticides: over-application or improper handling
Underground Storage Tanks	3	H	178	Stored materials: spills, leaks, or improper handling
Utility Substation Transformers	2	L	178 & 179	Chemicals and other materials including PCBs: spills, leaks, or improper handling

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(Continued from page 4)

facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.

- ✓ Educate local businesses on Massachusetts floordrain requirements. See brochure “Industrial Floor Drains” for more information.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone IIs contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the map as Release Tracking Numbers 40000181, 40000324, 40000500, 4-0010634, 4-0014577, 4-0014738, 4-0015175 and 4-0015426. Refer to the attached map and Appendix 3 for more information.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Currently, the Town does not have water supply protection controls that meet DEP’s Wellhead Protection regulations 310 CMR 22.21(2). Protection planning protects drinking water by managing the land area that supplies water to a well. A Wellhead Protection Plan coordinates community efforts, identifies protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Wrentham’s Aquifer Protection Advisory Committee should develop and implement a Wellhead Protection Plan. Refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP’s guidance, “Developing a Local Wellhead Protection Plan”.
- ✓ Coordinate efforts with local officials to compare local wellhead protection controls with current MA Wellhead Protection Regulations 310 CMR 22.21 (2). If there are no local controls or they do not meet the current regulations, adopt controls that meet 310 CMR 22.21(2). For more information on DEP

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ➊ Reduces Risk to Human Health
- ➋ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ➌ Supports municipal bylaws, making them less likely to be challenged
- ➍ Ensures clean drinking water supplies for future generations
- ➎ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.



- land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floordrains, be sure to include floordrain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II include dry cleaners, repair shops, gas stations, a golf course and a school. Refer to Table 2 for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation by the water supplier and the Aquifer Protection Advisory Committee will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific best management practices (BMPs) should be used to better protect your water supply.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	NO	Educate homeowners in Franklin Street Wells Zone Is on source protection. Also, remove Route 140 stormwater flows from Zone Is.
Is the Zone I posted with “Public Drinking Water Supply” Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is Zone I regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	NO	Continue to monitoring non-water supply activities in Zone Is.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Wellhead Protection Controls that meet 310 CMR 22.21(2)?	YES	The Town “Aquifer Protection District” bylaw meets DEP’s best efforts for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the Zone II areas extending into their communities?		Work with neighboring municipalities to include Zone IIs in their wellhead protection controls.
Planning		
Does the PWS have a Wellhead Protection Plan?	NO	Develop a wellhead protection plan. Follow “Developing a Local Wellhead Protection Plan” available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal “Emergency Response Plan” to deal with spills or other emergencies?	YES	Update plan regularly, coordinate emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Participate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	YES	Use the Aquifer Protection Advisory Committee to develop a Wellhead Protection Plan.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see “Hazardous Materials Management: A Community's Guide” at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide wellhead protection education?	YES	Aim additional efforts at commercial, industrial and municipal uses within the Zone II.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, Wrentham's Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Support and participation in the Aquifer Protection Advisory Committee.
- Providing wellhead protection education.
- Adoption of the local bylaws and health regulations required to meet DEP's Wellhead Protection Controls, 310 CMR 22.21(2).

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Develop and implement a Wellhead Protection Plan.
- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.
- ✓ Continue to educate residents on ways they can help you to protect drinking water sources.
- ✓ Continue to work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone II and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Wellhead Protection Grant Program and Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone II. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

APPENDIX A: REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREA

Fac#	Facility Name	Street	Town	RO#	Old Sys ID	Phone	Type	Class	SWAP Description
35372	DIPLACIDO CORP THOMAS W	20 INDUSTRIAL RD	WRENTHAM	158971	MAD981892672	(508) 384-2030	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
131277	ANDERSON GREENWOOD CROSBY	43 KENDRICK ST	WRENTHAM	635	MAG250431	(508) 384-3121	SURFAC	SUROTH	Surface Water Discharge
				54536	1200403	(508) 384-3121	PLANT	BM1000	Air Quality Permit
	ANDERSON GREENWOOD & CROSBY			26310	MAD001012673	(508) 384-3121	HANDLR	SQG	Small Quantity Generator of Haz Waste
131279	KING PHILLIP REGIONAL HIGH SCHOOL	201 FRANKLIN ST	WRENTHAM	34955	MAD981886021	(508) 384-3144	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
	KING PHILIP REGIONAL HIGH SCHOOL			54662	1200794	(508) 384-1010	PLANT	BM1000	Air Quality Permit
131282	WRENTHAM STEEL PRODUCTS	34 KENDRICK ST	WRENTHAM	215242	MAD001410935	(508) 384-2166	HANDLR	SQG	Small Quantity Generator of Haz Waste
	WRENTHAM STEEL PROD			54760	1200915	(508) 384-2166	PLANT	BM150	Air Quality Permit
	WRENTHAM STEEL PRODUCTS CO INC			1109	0833		SURFAC	SUROTH	Surface Water Discharge
132412	WRENTHAM REGIONAL SERVICE CENTER INC	1 DEPOT ST	WRENTHAM	126654	MF0007956	(508) 384-3221	FULDSP	FULDSP	Fuel Dispenser
	WRENTHAM REGIONAL SERVICE CENTER			35634	MAD981896525	(508) 384-3221	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
209166	WAMPUM CORNER AUTO SERVICE INC	650 SOUTH ST	WRENTHAM	209167	MF0010618	(508) 660-1118	FULDSP	FULDSP	Fuel Dispenser
211035	POND HOME NURSING HOME	289 EAST ST	WRENTHAM	311509	0658		GROUND	GROMAJ	Groundwater Discharge
336362	MINSK ENTERPRISES LTD INC	141 FRANKLIN ST	WRENTHAM	336363	MAD066587338		HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
340343	LARRY BROOKS SEPTIC INC	444 DEDHAM ST	WRENTHAM	340344	00100398	(508) 384-6000	DISCH	MWR-SC	MWRA Sewer Connection
361318	WRENTHAM DPW	360 TAUNTON ST	WRENTHAM	361319		(508) 384-5477	FULDSP	FULDSP	Fuel Dispenser
368111	EXXONMOBIL OIL CORP MOBIL 11723	165 SOUTH ST	WRENTHAM	372214	MAD985297027	(303) 986-8011	HANDLR	VSQG	Very Small Quantity Generator of Haz Waste
				368112		(508) 384-8040	FULDSP	FULDSP	Fuel Dispenser
368113	MOBIL 18507	1001 SOUTH ST	WRENTHAM	368114		(508) 384-5390	FULDSP	FULDSP	Fuel Dispenser

APPENDIX B – Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas

DEP's datalayer depicting oil and/or hazardous material (OHM) sites is a statewide point data set that contains the approximate location of known sources of contamination that have been both reported and classified under Chapter 21E of the Massachusetts General Laws. Location types presented in the layer include the approximate center of the site, the center of the building on the property where the release occurred, the source of contamination, or the location of an on-site monitoring well. Although this assessment identifies OHM sites near the source of your drinking water, the risks to the source posed by each site may be different. The kind of contaminant and the local geology may have an effect on whether the site poses an actual or potential threat to the source.

The DEP's Chapter 21E program relies on licensed site professionals (LSPs) to oversee cleanups at most sites, while the DEP's Bureau of Waste Site Cleanup (BWSC) program retains oversight at the most serious sites. This privatized program obliges potentially responsible parties and LSPs to comply with DEP regulations (the Massachusetts Contingency Plan – MCP), which require that sites within drinking water source protection areas be cleaned up to drinking water standards.

For more information about the state's OHM site cleanup process to which these sites are subject and how this complements the drinking water protection program, please visit the BWSC web page at <http://www.state.ma.us/dep/bwsc>. You may obtain site -specific information two ways: by using the BWSC Searchable Sites database at <http://www.state.ma.us/dep/bwsc/sitelist.htm>, or you may visit the DEP regional office and review the site file. These files contain more detailed information, including cleanup status, site history, contamination levels, maps, correspondence and investigation reports, however you must call the regional office in order to schedule an appointment to view the file.

The table below contains the list of Tier Classified oil and/or Hazardous Material Release Sites that are located within your drinking water source protection area.

Table 1: Bureau of Waste Site Cleanup Tier Classified Oil and/or Hazardous Material Release Sites (Chapter 21E Sites) - Listed by Release Tracking Number (RTN)

RTN	Release Site Address	Town	Contaminant Type
4-0000181	775 SOUTH ST	WRENTHAM	
4-0000324	485 EAST ST	WRENTHAM	Oil
4-0000500	185 SOUTH STREET	WRENTHAM	Oil
4-0010634	4 WEST ST	WRENTHAM	Oil
4-0014577	43 KENDRICK ST	WRENTHAM	Hazardous Material
4-0014738	60 EAST ST	WRENTHAM	Oil
4-0015175	650 SOUTH ST	WRENTHAM	Oil and Hazardous Material
4-0015426	825 WASHINGTON ST	WRENTHAM	Oil

For more location information, please see the attached map. The map lists the release sites by RTN.



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Wrentham Developmental Center

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
May 19, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Wrentham Developmental Center
PWS Address	144 Emerald Street
City/Town	Wrentham, Massachusetts
PWS ID Number	4350001
Local Contact	David Perry
Phone Number	(508) 384-1658

Well Name	Source ID#	Zone I (in feet)	Zone II#	Source Susceptibility
Station #1	4350001-01G	400	270	Moderate
Station #2	4350001-02G	400	270	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The two wells for the Wrentham Developmental Center (the Center) share the same Zone II that is located within the towns of Wrentham and Norfolk. Each well has a Zone I of 400 feet. The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone I and Zone II.

Water from the wells is not treated before entering the distribution system. For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II for the Center is a mixture of forest and residential land use (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Zone Is
2. Residential land uses
3. Schools
4. Transportation corridors

The overall ranking of susceptibility to contamination for the system is moderate, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2.

1. Zone Is – The Zone I for each of the wells is a 400 foot radius around the wellhead. Massachusetts drinking water regulations (310 CMR 22.00 Drinking Water) requires public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. The Zone Is for the wells are owned or controlled by the public water system. Only water supply activities are allowed in the Zone I. The Zone Is for the wells are forest and wetlands with an access road to the pump house. An electric utility transformer is located on the utility pole outside of the pump house, although most transformers have been upgraded and no longer use PCBs, the water supplier should verify that the transformer does not contain PCBs.

Zone I Recommendations:

- ✓ Ensure that the electric transformer located outside of the pump house does not contain PCBs. Your electric utility company can assist in making this determination.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – Approximately 45% of the Zone II consists of residential areas. None of the areas have public sewers, and so all use septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	Zone II	Threat	Comments
Local Roads	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Schools	No	Yes	Moderate	Educate schools on source protection BMPs.
Residential – Septic Systems	No	Yes	Moderate	Educate residents on proper septic system operation and maintenance.
Residential – Lawn Care	No	Yes	Moderate	Educate residents on proper lawn care techniques.
Residential – Fuel Oil Storage	No	Yes	Moderate	Educate residents on proper hazardous materials storage and use.
Stormwater	No	Yes	Moderate	Map stormwater drainage and include key locations in your emergency response plan.

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in the attachments and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at mass.gov/dep/brp/wm/nonpoint.htm.

3. Schools - There are two schools in the Zone II. Activities associated with schools commonly involve hazardous materials such as fuel oil, laboratory, art, photographic, machine shop, and other chemicals. These hazardous materials have the potential to impact drinking water supplies if they are improperly handled, stored, or materials are improperly disposed into septic systems.

Schools recommendations:

- ✓ Contact schools in the Zone II to discuss source protection issues including BMPs that they can reduce the risk of contamination.
- ✓ Assist schools with source protection education for maintenance staff, food preparation staff, teachers and students.

4. Transportation Corridors - Local roads exist throughout the Zone II. Roadway construction, maintenance, and typical highway use can all be potential sources of contamination. Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash in to catchbasins.

Transportation Corridor Recommendations:

- ✓ Identify stormwater drains and the drainage system along transportation corridors.
- ✓ Work with the Towns to have catch basins inspected, maintained, and cleaned on a regular schedule. Street sweeping reduces the amount of potential contaminants in runoff.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained.
- ✓ If storm drainage maps are available, review the maps with

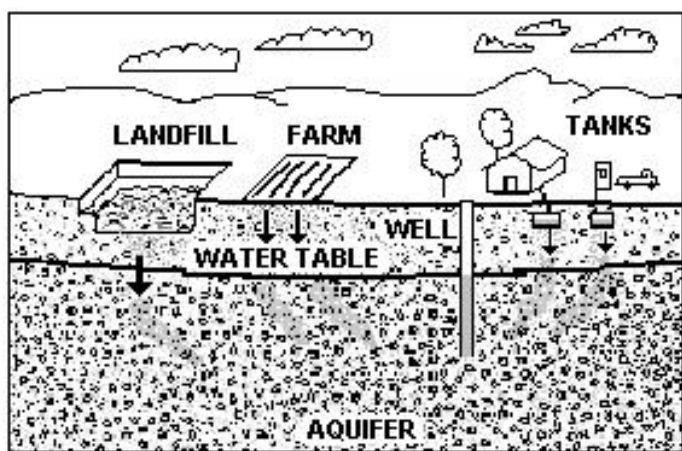


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

emergency response teams. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.

Refer to Table 2 for a complete list of land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. The Center is commended for current protection measures including:

- Ownership of the Zone I.
- Posting signs at the wellhead (after the SWAP visit).
- Posting of an emergency response list at the pumphouse.

The Center should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Work with schools and residents on source protection issues.

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Investigate if the transformer next to pump house contains PCBs.
- ✓ Prohibit public access to the well and pumphouse by locking facilities and gating roads.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check any above ground tanks for leaks, etc.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Planning:

- ✓ Work with local officials in Wrentham and Norfolk to include the Center's Zone II in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure
- Healthy Schools Fact Sheet



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Mount St. Mary's Abbey

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- ? Inventory land uses within the recharge areas of all public water supply sources;
- ? Assess the susceptibility of drinking water sources to contamination from these land uses; and
- ? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the
Massachusetts Department of
Environmental Protection,
Bureau of Resource Protection,
Drinking Water Program

Date Prepared:
December 9, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Mount St. Mary's Abbey
PWS Address	300 Arnold Street
City/Town	Wrentham, Massachusetts
PWS ID Number	4350003
Local Contact	Sister Marcia Trinke
Phone Number	(508) 528-1282

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Old Well	4350003-01G	400	2,640	High
Well #2 New Bedrock Well	4350003-02G	400	2,640	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:

1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The drinking water supply well for Mount St. Mary's Abbey is located in the Town of Franklin near the Franklin/Wrentham town line. Water is drawn from two groundwater wells with Zone I radii of 400 feet and an Interim Wellhead Protection Areas (IWPAs) radii of one-half mile (2,640 feet). The wells are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone Is and IWPAs.

Water from the wells is not treated before entering the distribution system. For current

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

information on monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The land uses in the IWPA is mostly a mixture of forest, agricultural and residential (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include:

1. Zone I
2. Residential Land Uses
3. Underground Storage Tanks
4. Agricultural Uses
5. Presence of Oil or Hazardous Material Contamination Site

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2.

1. Zone I – The Zone I for the wells are circular areas with 400-foot radii that is centered at the wellheads. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. The Zone Is are owned by the public water system. Non-water-supply uses within the Zone I for the Old Well include an underground storage tank (UST) and an above ground storage tank (AST) containing fuel oil, buildings (other than the pump house), garages, parking spaces, and storage of 5-gallon gasoline containers for maintenance equipment. An electric utility transformer is located on the utility pole outside of the pump house, although most transformers have been upgraded and no longer use PCBs, the water supplier should verify that the transformer does not contain PCBs. The Zone I for the New Bedrock Well contains agricultural activities

Zone I Recommendations:

- ✓ The floor drain in the pump house should be registered with the Underground Injection Control (UIC) Program in the DEP's Bureau of Resource Protection.
- ✓ Ensure that the electric transformer located outside of the pump house does not

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Manure Spreading	No	Yes	High	Spreading of manure provides a source for nitrate/nitrite contamination of groundwater
Pesticide Storage or Use	No	Yes	High	Pesticides: leaks, spills, improper handling, or over-application
Underground Storage Tank	Yes	Yes	High	Stored materials: spills, leaks, or improper handling
Residential – Septic Systems	No	Yes	Moderate	Educate residents on proper septic system operation and maintenance.
Residential – Lawn Care	No	Yes	Moderate	Educate residents on proper lawn care techniques.
Above Ground Storage Tanks	Yes	Yes	Moderate	Stored materials: spills, leaks, or improper handling
Cemetery	No	Yes	Moderate	Historic embalming fluids

* -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone I I. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

- ✓ contain PCBs. Your electric utility company can assist in making this determination.
- ✓ Keep any new non water supply activities out of the Zone I.

2. Residential Land Uses – A portion of the IWPA area consists of residential land use. None of the areas have public sewers, therefore, all use on-site septic systems. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (UST and AST) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet “Residents Protect Drinking Water” available in the attachments and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls. Visit DEP’s web site for additional information and assistance at mass.gov/dep/brp/wm/nonpoint.htm.

3. Underground Storage Tanks – An Underground Storage Tank (UST) containing fuel oil is located within the Zone I. The UST is double walled, has monitoring with

alarm, and is placed within a cement vault. If managed improperly, USTs can be a potential source of contamination due to leaks or spills of the chemicals they store.

Recommendation:

- ✓ Any modifications to the UST must be accomplished in a manner consistent with Massachusetts’s plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- ✓ The Department recommends that you inspect, maintain and replace or upgrade components of your heating system regularly. Inspect oil lines (i.e. furnace to tank) for corrosion or pitting and replace copper lines with lines encased in a protective sleeve or install UL listed oil safety valves to prevent leaks.
- ✓ During refilling of the UST, ensure that the operator of the oil transport tanker does not leave the vehicle area while the UST is being filled.

4. Agricultural Uses – Crop lands and an apple orchard exist

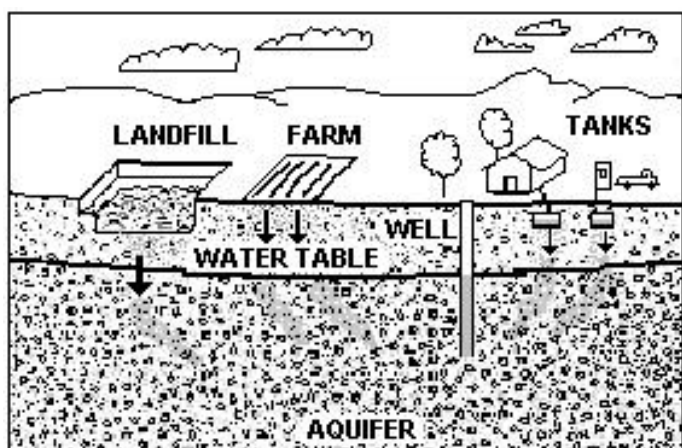


Figure 1: Example of how a well could become contaminated by different land uses and activities.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at:
www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws/, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

within the IWPA. Over-application of pesticides and fertilizers on crop lands and orchards is a potential source of contamination to the water supply. Manure spreading is often applied to hay fields. Nitrate and nitrite contamination from manure spreading applications could potentially impact the water quality at the well. Mount St. Mary's Abbey does not use pesticides on the hay fields that it owns.

Agricultural Use Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a US Natural Resources Conservation Service farm plan to protect water supplies.
- ✓ Work with farmers to investigate grants and loans designed to protect surface and groundwater. See <http://www.nrcs.usda.gov/programs/farmland/2002/pdf/EQIPFct.pdf> for more information on the USDA Environmental Quality Incentives Program (EQIP). Information on the MA Department Agricultural Resources' Agricultural Environmental Enhancement Program (AEEP) is available on the web at <http://www.state.ma.us/dfa/programs/aEEP/>.

5. Presence of Oil or Hazardous Material Contamination Sites – Based upon a DEP web site database query (<http://www.state.ma.us/dep/bwsc/sitelist.htm>), the IWPA area contains a DEP Tier 1D Classified Oil and/or Hazardous Material Release Site indicated on the map as Release Tracking Number (RTN) 4-0013514. The site is listed as an oil release site and is located on Mount St. Mary's Abbey property. See for a listing of these

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil release site.
- ✓ If the oil spill associated with the site listed as RTN #4-0013514 is identical to the spill associated with the recently closed site listed as RTN #4-0014509, then Mount St. Mary's Abbey should contact DEP's Bureau of Waste Site Cleanup (BWSC) in the Lakeville office to determine whether RTN #4-0013514 can be closed out.

Refer to Table 2 for a complete list of land uses. Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the wells' susceptibility to contamination. Mount St. Mary's Abbey is commended for current protection measures including:

- Using only sand on roads and driveways during winter storm events.

- Having an approved wellhead protection plan.

Mount St. Mary's Abbey should review and adopt the key recommendations above and the following:

Zone I:

- ✓ Keep non-water supply activities out of the Zone I.
- ✓ Investigate if the transformer next to pumphouse contains PCBs.
- ✓ Redirect road and parking lot drainage in the Zone I away from well.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

Facilities Management:

- ✓ DEP records indicate that the floor drain in the pump house is not registered with the UIC Program. Mount St. Mary's Abbey should contact the UIC Program at (617) 348-4014 to register the floor drain. Additional information about the

UIC Program is available on-line at <http://www.state.ma.us/dep/brp/dws/uic.htm>.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ Work with local officials in Wrentham and Franklin to include the IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Factsheet
- Your Septic System Brochure
- Pesticide Use Factsheet
- Industrial Floor Drains Brochure



Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

Yarmouth Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, disinfecting, filtering, or treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

<i>PWS Name</i>	Yarmouth Water Department
<i>PWS Address</i>	99 Buck Island Road
<i>City/Town</i>	West Yarmouth, Massachusetts 02673
<i>PWS ID Number</i>	4351000
<i>Local Contact</i>	Danny J. Mills
<i>Phone Number</i>	(508) 771-7921

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential contaminant sources, including storm runoff, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:

This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate Best Management Practices (BMPs) and drinking water source protection measures.

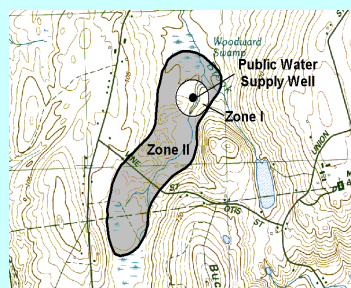
Refer to Table 3 for Recommendations to address potential sources of contamination. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
4. Appendices

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and a Zone II protection area.



Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material (i.e. clay) that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. This area should be owned or controlled by the water supplier and limited to water supply activities.

Zone II: The primary recharge area for the aquifer. This area is defined by hydrogeologic studies that must be approved by DEP. Refer to the attached map to determine the land within your Zone II.

Section 1: Description of the Water System

Zone II #: 157

Susceptibility: High

Well Names	Source IDs
Well #1	4351000-02G
Well #2	4351000-03G
Well #3	4351000-04G
Well #13	4351000-13G
Well #14	4351000-14G
Well #17	4351000-17G
Well #18	4351000-18G
Well #19	4351000-19G
Well #20	4351000-20G
Well #23	4351000-23G
Well #24	4351000-24G

Zone II #: 168

Susceptibility: High

Well Names	Source IDs
Well #1M	4351000-01G

Zone II #: 169

Susceptibility: Moderate

Well Names	Source IDs
Well #21	4351000-21G
Well #22	4351000-22G

Zone II #: 170

Susceptibility: Moderate

Well Names	Source IDs
Well #10	4351000-11G
Well #11	4351000-12G

Zone II #: 171

Susceptibility: High

Well Names	Source IDs
Well #15	4351000-15G
Well #16	4351000-16G

Zone II #: 172

Susceptibility: High

Well Names	Source IDs
Well #6	4351000-07G
Well #7	4351000-08G
Well #8	4351000-09G
Well #9	4351000-10G

Zone II #: 173

Susceptibility: Moderate

Well Names	Source IDs
Well #4	4351000-05G
Well #5	4351000-06G

The Yarmouth Water Department (Yarmouth) maintains and operates twenty four public water supply sources. Yarmouth's sources are located within the Cape Cod basin. The wellhead protection areas for Well #1 (02G), Well #2 (03G), Well #3 (04G), Well #13 (13G), Well #14 (14G), Well #17 (17G), Well #18 (18G), Well #19 (19G), Well #20 (20G), Well #23 (23G), and Well #24 (24G) is located in Yarmouth, with a small portion extending into Barnstable; the wellhead protection areas for Well #1M (01G), Well #4 (05G) and Well #5 (06G), Well #10 (11G) and Well #11 (12G), and for Well #15 (15G) and Well #16 (16G) are located entirely in Yarmouth; the wellhead protection areas for Well #21 (21G) and Well #22 (22G), and for Well #6 (07G), Well #7 (08G), Well #8 (09G), and Well #9 (10G) are located in Yarmouth, with a very small portion extending into Dennis. The wells are located in aquifers with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. Please refer to the attached map to view the boundaries of the Zone IIs.

For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data are also available on the web at <http://www.epa.gov/safewater/ccr1.html>.



Section 2: Land Uses in the Protection Areas

The Zone IIs for Yarmouth are primarily a mixture of forest and residential land uses, with a small portion consisting of recreational, commercial and industrial activities (refer to attached map for details). Land uses and activities that are potential sources of contamination are listed in Table 2, with further detail provided in the Table of Regulated Facilities and Table of Underground Storage Tanks in Appendix B.

Key Land Uses and Protection Issues include:

1. Activities in Zone I
2. Hazardous Materials Storage and Use
3. Residential Land Uses
4. Transportation Corridors
5. Oil or Hazardous Material Contamination Sites
6. Comprehensive Wellhead Protection Planning

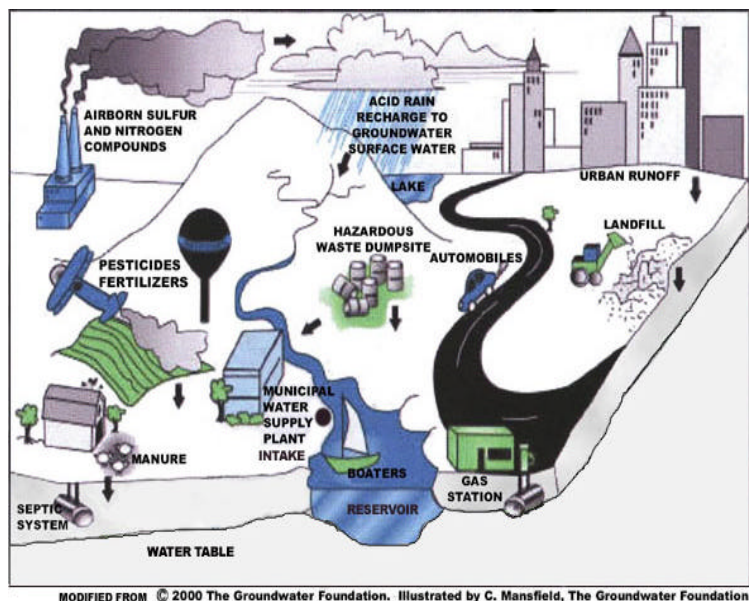


Figure 1: Sample watershed with examples of potential sources of contamination

The overall ranking of susceptibility to contamination for the wellhead protection areas for: Higgins Crowell Well (02G), Well #2 (03G), Well #3 (04G), Well #13 (13G), Well #14 (14G), Well #17 (17G), Well #18 (18G), Well #19 (19G), Well #20 (20G), Well #23 (23G), Well #24 (24G), Well #15 (15G), Well #16 (16G), Well #1M (01G), Well #15 (15G), Well #16 (16G), Well #6 (07G), Well #7 (08G), Well #8 (09G), and Well #9 (10G) is high based on the presence of at least one high threat land use within the water supply protection areas, as seen in Table 2. The overall ranking of susceptibility to contamination for the wellhead protection areas for: Well #10 (11G), Well #11 (12G), Well #21 (21G), Well #22 (22G), Well #4 (05G) and Well #5 (06G), is moderate, based on the presence of at least one moderate threat land use within the water supply protection areas, as seen in Table 2.

1. Activities in Zone Is – The Zone I for all of Yarmouth's wells is a 400 foot radius around each wellhead. Massachusetts drinking water regulations (310 CMR 22.00) require public water suppliers to own the Zone I, or control the Zone I through a conservation restriction. Only water supply activities are allowed in the Zone I. However, many public water supplies were developed prior to the Department's regulations and contain non-water supply

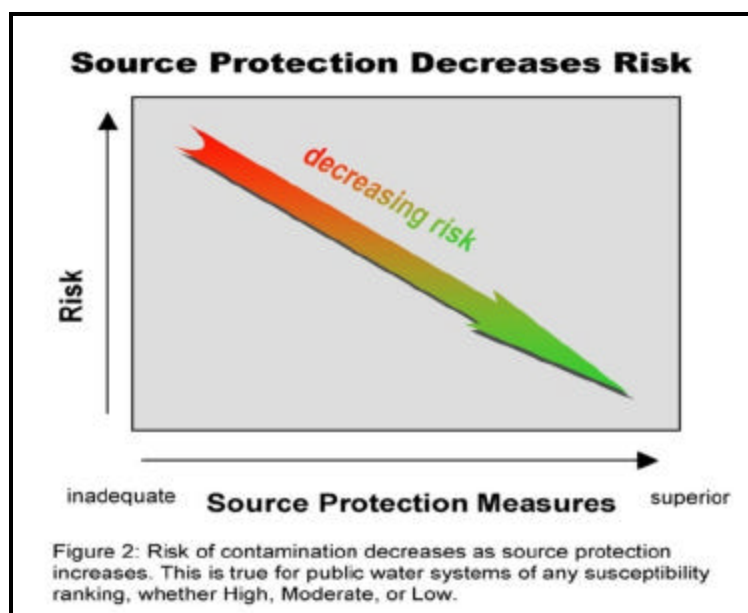
activities such as homes and public roads. The Zone I for: Well #1M (01G) contains a portion of Union Street and residential activities; Well 15 (15G) and Well 16 (16G) contain a portion of a gravel pit operation; Well #21 (21G) contains a transmission line right-of-way; Well #9 (10G) contains residential activities; Well #6 (07G) contains local roads and residential activities; Well #7 (08G) contains local roads; Well #17 (17G) contains a small portion of residential activities; Well #3 (04G) contains a portions of the Mid Cape Highway (Route 6); and, Well #1 (02G) contains a portion of Higgins Crowell Road.

Zone I Recommendations:

- ✓ To the extent possible, remove all non-water supply activities from the Zone Is to comply with DEP's Zone I requirements.
- ✓ Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals and maintenance chemicals.
- ✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.
- ✓ Keep any new non-water supply activities out of the Zone I.

2. Hazardous Materials Storage and Use – Many large and small businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials in Underground Storage Tanks

(Continued on page 7)



Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Protection Areas (Zones I and II)

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources*
Agricultural				
Fertilizer Storage or Use	1	M	168, 172	Leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	1	H	168, 172	Leaks, spills, improper handling, or over-application of pesticides
Commercial				
Airports	1	H	157	Spills, leaks, or improper handling of fuels, de-icers, salt, and other hazardous chemicals
Car/Truck/Bus Washes	1	L	157	Improper management of vehicle wash water; soaps; oils; greases; metals; salts
Body Shops	2	H	157, 171	Improper management of vehicle paints, solvents, and primer products
Gas Stations	7	H	168, 171, 172	Spills, leaks, or improper handling or storage of automotive fluids and fuels
Service Stations/ Auto Repair Shops	1	H	171	Automotive fluids and solvents: spills, leaks, or improper handling
Bus and Truck Terminals	3	H	157, 171	Spills, leaks, or improper handling of fuels and maintenance chemicals
Dry Cleaners	1	H	171	Spills, leaks, or improper handling of solvents and wastes
Golf Courses	3	M	157, 171, 172	Over-application or improper handling of fertilizers or pesticides
Medical Facilities	1	M	171	Spills, leaks, or improper handling or storage of biological, chemical, and radioactive wastes
Sand and Gravel Mining/ Washing	1	M	171	Spills or leaks from heavy equipment, fuel storage, clandestine dumping
Industrial				
Asphalt, Coal Tar, And Concrete Plants	1	M	172	Spills, leaks, or improper handling or storage of hazardous chemicals and wastes
Residential				
Fuel Oil Storage (at residences)	100+	M	all	Fuel oil: spills, leaks, or improper handling
Lawn Care/Gardening	100+	M	all	Pesticides: over-application or improper storage and disposal
Septic Systems/Cesspools	100+	M	all	Hazardous chemicals: microbial contaminants, and improper disposal

Land Uses	Quantity	Threat	Zone II #	Potential Contaminant Sources*
Miscellaneous				
Aboveground Storage Tanks	10	M	157, 171	Spills, leaks, or improper handling of materials stored in tanks
Aquatic Wildlife	numerous	L	all	Microbial contaminants
Fishing/Boating	numerous	L	172, 173	Fuel and other chemical spills, microbial contaminants
Large Quantity Hazardous Waste Generators	1	H	157	Spills, leaks, or improper handling or storage of hazardous materials and waste
Oil or Hazardous Material Sites	5	--	157, 170, 171, 172, 173	Tier Classified Oil or Hazardous Materials Sites are not ranked due to their site-specific character. Individual sites are identified in Appendix B.
Schools, Colleges, and Universities	2	M	157, 172	Spills, leaks, or improper handling or storage of fuel oil, laboratory, art, photographic, machine shop, and other chemicals
Small Quantity Hazardous Waste Generators	3	M	157, 171	Spills, leaks, or improper handling or storage of hazardous materials and waste
Stormwater Drains/Retention Basins	100+	L	all	Debris, pet waste, and chemicals in stormwater from roads, parking lots, and lawns
Transmission Line Rights-of-Way	1	L	157, 168, 169	Construction and corridor maintenance, over-application or improper handling of herbicides
Transportation Corridors	1	M	157, 171, 172	Accidental leaks or spills of fuels and other hazardous materials, over-application or improper handling of pesticides
Underground Storage Tanks	25	H	157, 171, 172	Spills, leaks, or improper handling of stored materials
Very Small Quantity Hazardous Waste Generators	6	L	157, 171	Spills, leaks, or improper handling or storage of hazardous materials and waste
Waste Transfer/Recycling Station	1	M	171	Improper management, seepage, and runoff of water containing waste materials
Wastewater Treatment Plant/Collection Facility/Lagoon	1	M	171	Improper handling or storage of treatment chemicals or equipment maintenance materials; improper management of wastewater

Table 2 Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

* **THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

(USTs) and Aboveground Storage Tanks (ASTs). Although many facilities within Yarmouth's Zone IIs use BMPs, hazardous materials and waste can be unexpectedly released through spills, leaks or improper handling or storage, and become potential sources of contamination. Hazardous materials should never be disposed of to a septic system or floor drain leading directly to the ground.

Hazardous Materials Storage and Use Recommendations:

- ✓ Educate local businesses on BMPs for protecting water supplies, and encourage them to use BMPs for handling, storing and disposing of hazardous waste. Distribute the fact sheet "Businesses Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business uses.
- ✓ Work with local businesses to register those facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- ✓ Educate local businesses on Massachusetts floor drain requirements. See brochure "Industrial Floor Drains" for more information.

3. Residential Land Uses – Approximately 50% of the combined Zone IIs consist of residential areas, of which a portion is served by private septic systems, with the remainder being served by municipal sewerage. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained they can be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

Residential Land Use Recommendations:

- ✓ Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.
- ✓ Work with planners to control new residential developments in the water supply protection areas.
- ✓ Promote BMPs for stormwater management and pollution controls.

4. Transportation Corridors - Transportation corridors and other paved and unpaved local roads cross through the water supply protection areas. Spills from vehicular accidents are a major concern. In addition, roadway construction, maintenance, and typical highway use can all be potential sources of contamination.

Accidents can lead to spills of gasoline and other potentially dangerous transported chemicals. Roadways are frequent sites for illegal dumping of

What is a Zone III?

A Zone III (the secondary recharge area) is the land beyond the Zone II from which surface and ground water drain to the Zone II and is often coincident with a watershed boundary.

The Zone III is defined as a secondary recharge area for one or both of the following reasons:

1. The low permeability of underground water bearing materials in this area significantly reduces the rate of groundwater and potential contaminant flow into the Zone II.
2. The groundwater in this area discharges to a surface water feature such as a river, rather than discharging directly into the aquifer.

The land uses within the Zone III are assessed only for sources that are shown to be groundwater under the direct influence of surface water.

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

hazardous or other potentially harmful wastes. De-icing salt, automotive chemicals and other debris on roads are picked up by stormwater and wash into catch basins.

Transportation Corridor Recommendations:

- ✓ Wherever possible, ensure that drains discharge stormwater outside of the Zone I.
- ✓ Identify stormwater drainage systems along transportation corridors. If maps aren't yet available, work with town officials to investigate mapping options such as the upcoming Phase II Stormwater Rule requiring some communities to complete stormwater mapping.
- ✓ Work with local emergency response teams to ensure that any spills within the Zone II can be effectively contained. Review storm drainage maps with emergency response teams.
- ✓ Work with the Town and State to best manage stormwater in the Zone II. BMPs include street sweeping, vegetative swales, and regular catch basin inspection, cleaning and maintenance.

5. Presence of Oil or Hazardous Material Contamination Sites – The Zone IIs for Yarmouth's wells contain DEP Tier Classified Oil and/or Hazardous Material Release Sites indicated on the maps as Release Tracking Numbers 4-0012139, 40012473, 40014213, 40014515, and 4-0014582. Refer to the attached maps and Appendix B for more information on these sites, and for information on DEP Tier Classified Oil and/or Hazardous Material Release Sites within the Zone IIs for the Yarmouth's wells.

Oil or Hazardous Material Contamination Sites Recommendation:

- ✓ Monitor progress on any ongoing remedial action conducted for the known oil or contamination sites.

6. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a reservoir. Currently, the Town of Yarmouth has a groundwater protection bylaw that meets DEP's Groundwater Protection regulations 310 CMR 22.21. A Wellhead Protection Plan coordinates community efforts, identifies

protection strategies, establishes a timeframe for implementation, and provides a forum for public participation. There are resources available to help communities develop a plan for protecting drinking water supply wells.

Protection Planning Recommendations:

- ✓ Develop a Wellhead Protection Plan. Establish a protection team, and refer them to <http://mass.gov/dep/brp/dws/protect.htm> for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan".
- ✓ Coordinate efforts with the Towns of Barnstable and Dennis to include Yarmouth's source protection areas in local wellhead protection controls. For more information on DEP land use controls see <http://mass.gov/dep/brp/dws/protect.htm>.
- ✓ If local controls do not regulate floor drains, be sure to include floor drain controls that meet 310 CMR 22.21(2).
- ✓ Work with town boards to review and provide recommendations on proposed development within your water supply protection areas. To obtain information on build-out analyses for the town, see the Executive Office of Environmental Affairs' community preservation web site, <http://commpres.env.state.ma.us/>.

Other land uses and activities within the Zone II are included in Table 2. Refer to Table 2 and Appendix A for more information about these land uses.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Top 5 Reasons to Develop a Local Wellhead Protection Plan

- ❶ Reduces Risk to Human Health
- ❷ Cost Effective! Reduces or Eliminates Costs Associated With:
 - ♦ Increased groundwater monitoring and treatment
 - ♦ Water supply clean up and remediation
 - ♦ Replacing a water supply
 - ♦ Purchasing water
- ❸ Supports municipal bylaws, making them less likely to be challenged
- ❹ Ensures clean drinking water supplies for future generations
- ❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone I		
Does the Public Water Supplier (PWS) own or control the entire Zone I?	YES Well #2 (03G), Well #13 (13G), Well #14 (14G), Well #18 (18G), Well #19 (19G), Well #20 (20G), Well #23 (23G), Well #24 (24G), Well #22 (22G), Well #10 (11G), Well #11 (12G), Well # (09G), Well #4 (05G)	Follow Best Management Practices (BMPs) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
	NO Well #1M (01G), Well #1 (02G), Well #3 (04G), Well #17 (17G), Well #15 (15G), Well #16(16G), Well #21(21G), Well #9 (10G), Well #6 (07G), Well #7 (08G)	To the extent possible, remove prohibited activities in Zone I to comply with DEP's Zone I requirements. Investigate options for gaining ownership or control of the Zone I.
Are the Zone Is posted with "Public Drinking Water Supply" Signs?	YES	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Are the Zone Is regularly inspected?	YES	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone I?	YES Well #2 (03G), Well #13 (13G), Well #14 (14G), Well #18 (18G), Well #19 (19G), Well #20 (20G), Well #23 (23G), Well #24 (24G), Well #22 (22G), Well #10 (11G), Well #11 (12G), Well # (09G), Well #4 (05G)	Monitor for any new non-water supply activities in Zone I, and investigate options for removing these activities.
	NO Well #1M (01G), Well #1 (02G), Well #3 (04G), Well #17 (17G), Well #15 (15G), Well #16(16G), Well #21(21G), Well #9 (10G), Well #6 (07G), Well #7 (08G)	Monitor prohibited activities in Zone I, and investigate options for removing these activities.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have local controls that meet Wellhead Protection Regulations 310 CMR 22.21(2)?	YES	The Town's bylaw meets DEP's requirements for wellhead protection. Refer to www.state.ma.us/dep/brp/dws/ for model bylaws and health regulations, and current regulations.
Do neighboring communities protect the water supply protection areas extending into their communities?	Unknown	Work with the Towns of Barnstable and Dennis to encourage them to adopt local controls that include Yarmouth's wellhead protection area.
Planning		
Does the PWS have a wellhead protection plan?	NO	Develop and implement a wellhead protection plan. Follow "Developing a Local Wellhead Protection Plan" available at: www.state.ma.us/dep/brp/dws/ .
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	YES	Supplement plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a wellhead protection committee?	NO	Establish a committee with representatives from citizens' groups, neighboring communities, and the business community.
Does the Board of Health conduct inspections of commercial and industrial activities?	YES	For more guidance see "Hazardous Materials Management: A Community's Guide" at www.state.ma.us/dep/brp/dws/files/hazmat.doc
Does the PWS provide watershed protection education?	Some	Increase residential outreach through bill stuffers, school programs, Drinking Water Week activities, and coordination with local groups. Aim additional efforts at commercial uses within the Zone IIs.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:

As with many water supply protection areas, the system Zone IIs contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2.

The water supplier is commended for taking an active role in promoting source protection measures in the Water Supply Protection Areas through:

- Actively enforcing existing wellhead protection control
- Purchasing land within the wellhead protection areas

Source Protection Recommendations:

To better protect the sources for the future:

- ✓ Inspect the Zone I regularly, and when feasible, remove any non-water supply activities.
- ✓ Educate residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone IIs and to cooperate on responding to spills or accidents.
- ✓ Partner with local businesses to ensure the proper storage, handling, and disposal of hazardous materials.
- ✓ Develop and implement a Wellhead Protection Plan.

Conclusions:

These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3 and the Key Issues above. DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community.

Grants and loans are available through the Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: <http://mass.gov/dep/brp/mf/mfpubs.htm>.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the Zone IIs. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

- A. Regulated Facilities within the Water Supply Protection Area
- B. Table of Tier Classified Oil and/or Hazardous Material Sites within the Water Supply Protection Areas
- C. Additional Documents on Source Protection

Additional Documents:

To help with source protection efforts, more information is available by request or online at mass.gov/dep/brp/dws including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

For More Information

Contact Isabel Collins in DEP's SERO at (508) 946-2726 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.