

**Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Scituate 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>	Scituate Water Division
<i>PWS Address</i>	4 Old Oaken Bucket
<i>City/Town</i>	Scituate, MA 02066
<i>PWS ID Number</i>	4264000
<i>Local Contact</i>	Eugene Babin, Supervisor
<i>Phone Number</i>	781-545-8735

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>Ground Water Sources</i>		<i>Susceptibility: High</i>	
<i>Source Name</i>		<i>Source Name</i>	
Well #10—Websters Meadow		4264000-01G	
Well #11—Websters Meadow		4264000-02G	
Well #17A—Stearns Meadow		4264000-03G	
Well #19—Edison Station		4264000-05G	
Well #22—Barnes Meadow		4264000-11G	
Well #18B		4264000-12G	

<i>Surface Water Sources</i>		<i>Susceptibility: High</i>	
<i>Source Name</i>		<i>Source ID #</i>	
Old Oaken Bucket		4264000-01S	

The Scituate Water Division has seven drinking water sources, six ground water wells and one reservoir, Old Oaken Bucket Pond. There are four Zone IIs for the wells.

The six wells and the reservoir are located in Scituate. Portions of the Zone IIs and the watershed extend into Norwell.

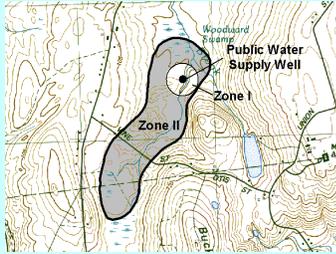
For current information on monitoring results and treatment or for a copy of the most recent Consumer Confidence Report, please contact the public water system contact person listed above in Table 1. Drinking water monitoring data is also available on the web at <http://www.epa.gov/safewater/ccr1.html>.

Section 2: Land Uses in the Protection Areas

The Zone II and watershed for the Scituate water system are primarily a mix of undeveloped forest and residential development, with smaller portions consisting of agriculture and commercial uses. A Geographic Information Systems (GIS) map showing the watershed boundaries, Zone A, Zone IIs 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 Scituate Water Division. 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. Chemical Storage
5. Oil or Hazardous Material Release Sites
6. Landfills
7. Auto. Repair/Storage
8. Gas/Service Station
9. Agriculture
10. Aquatic Wildlife
11. Golf Course
12. Underground Storage Tank

1. **Residential Land Uses** – About 33% of the Zone IIs of the wells and the watershed of the reservoir consists of residential homes. Fifty percent (50%) of those areas 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.

Residential Land Use Recommendations:

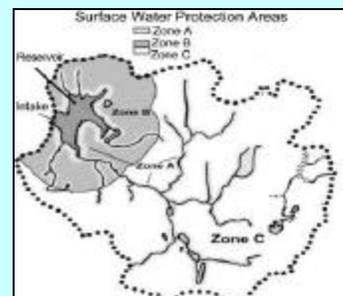
- ✓ Work with town officials to control residential growth on undeveloped land.
- ✓ See www.state.ma.us/envir/ to obtain information on the build-out analyses for communities into which the protection areas extend.
- ✓ Educate residents on how to protect water supplies. Distribute the fact sheet *Residents 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 watershed and in the Zone IIs.
- ✓ Work with the Planning Board, Conservation Commission and Board of Health to review and provide recommendations on proposed watershed or Zone II development.

2. **Transportation Corridors (paved and unpaved local roads and highways and railroads)** are located near the reservoir, throughout the watershed, and within the Zone IIs. Rt. 3A passes over Tack Factory Pond and is posted as a low-salt area. A commuter rail passes through the watershed and along the edge of the Zone II for Well 01G. 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 watershed and Zone IIs.
- ✓ Conduct an emergency drill to be ready for spills.
- ✓ Regularly inspect the watershed and Zone IIs 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 (herbicide applications) - Transmission lines run through the watershed and the Zone II of wells 05G and 11G. 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 to ensure that pesticide applications will minimize impacts on drinking water sources.

4. Chemical Storage - Routine water treatment chemicals are stored at the water treatment plant and at the wells.

Chemical Storage Recommendation:

- ✓ Provide sufficient secondary containment to control spills.

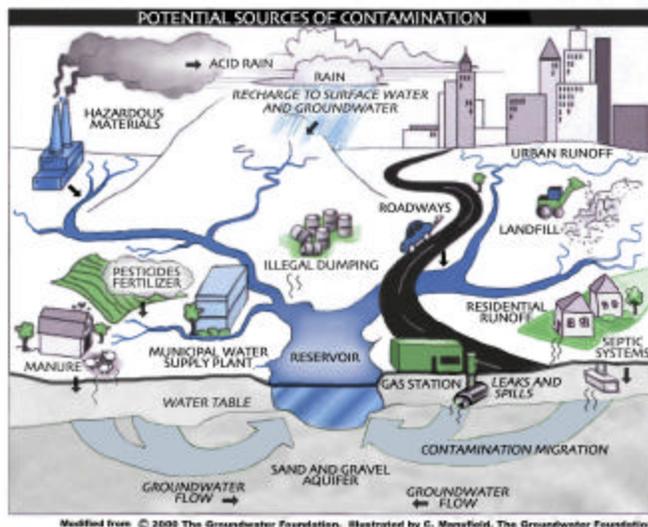


Figure 1: Sample watershed with examples of potential sources of contamination

5. Oil or Hazardous Material Release Sites - DEP Tier Classified Oil or Hazardous Material Release Sites are located within the Zone II of wells 05G and 11G and within the Zone A (but outside the watershed) of the reservoir. Refer to the attached 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.

6. Landfills - There is an older closed landfill, without a cap, and a closed, capped landfill within the watershed of Old Oaken Bucket.

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/M	wells	01S	leaks, spills, improper handling, or over-application of fertilizers
Pesticide Storage or Use	Few	H/H	wells	01S	leaks, spills, improper handling, or over-application of pesticides
Manure Spreading & Storage	Few	H/H	wells	01S	microbial - improper handling or storage can lead to runoff
Residential					
Fuel Oil Storage (at residences)	Numerous	M/M	wells	01S	spills, leaks, or improper handling of fuel oil
Lawn Care / Gardening	Numerous	M/M	wells	01S	over-application or improper storage and disposal of pesticides
Septic Systems / Cesspools	Numerous	M/M	wells	01S	microbial contaminants, improper disposal of hazardous chemicals
Commercial					
Auto. Repair Shops	Few	M	-	01S	improper management of paints, solvents, other products
Gas/Service Stations	Few	H	wells	-	spills, leaks from improper handling or storage of automotive fluids and fuels
Golf Course	1	M	12G	-	over-application or improper handling of fertilizers and pesticides

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	microbial contaminants
Landfills	2	H	-	01S	seepage of leachate; erosion
Transportation Corridors	Numerous	M/H	wells	01S	leaks or spills of fuels and other hazardous materials; over-application or improper handling of pesticides; erosion from construction
Transmission Lines	1	L/H	wells	01S	spills from over-application or improper handling of pesticides; erosion from
Chemical Storage	water system	H/H	wells	01S	spills, leaks, or improper handling or storage of chemicals
Underground Storage Tank	1	M	-	01S	leaks or spills of stored materials
DEP Tier Classified Oil or Hazardous Materials	4	not ranked	05G, 11G	01S	see Appendix C for more information

Notes:

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Landfill Recommendation:

- ✓ Work with local officials to monitor for leachate movement and chemical constituents.

7. **Auto Repair/Storage** - There are vehicle repair shops within the watershed.

Auto Repair/Storage Recommendation:

- ✓ Encourage the proper handling, storage, labeling, use and disposal of paints, solvents and other products associated with auto repair activities.

8. **Gas/Service Stations** - There are gas/service stations within the Zone IIs.

Gas/Service Station Recommendation:

- ✓ Encourage the proper handling, storage, labeling, use and disposal of solvents, fluids and other products associated with gas/service stations.

9. **Agriculture** – Cranberry bogs are located within the watershed and Zone II areas. 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 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

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.

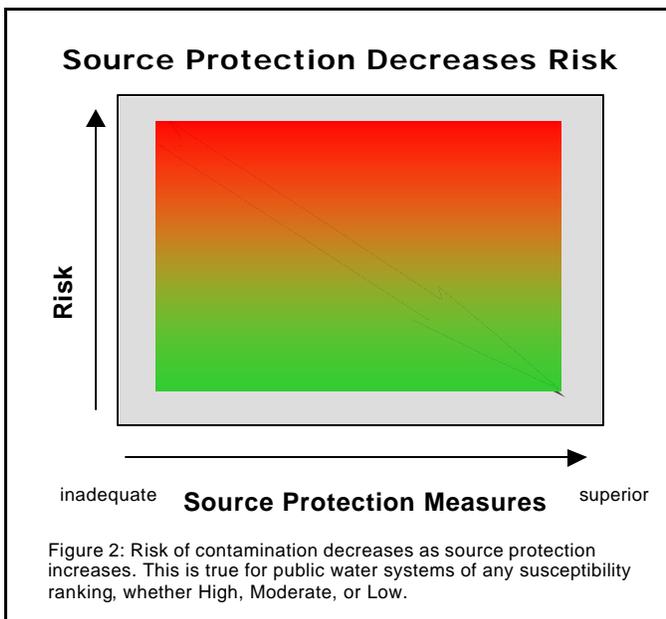
management of nutrients, pests, manure, grazing and irrigation.

- ✓ Work with farmers to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.

10. **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 in and around the reservoir. Discourage feeding of geese and other waterfowl.



11. **Golf Course** - Well 12G is located on a municipal golf course. Pesticide and fertilizer use at golf courses is a concern; however, the Water Division Supervisor reports that the Town cooperates with the water system regarding the operation of the course.

Golf Course Recommendation:

- ✓ Continue to work with the Town to minimize the use of pesticides and fertilizers.

12. **Underground Storage Tank (UST)** - There is an underground storage tank located within the watershed.

UST Recommendation:

- ✓ Encourage the owner of the tank to install secondary containment to control spills.

Section 3: Source Water Protection

As with many water supply protection areas, this system's Zone IIs and watershed contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. **The Scituate Water Division is commended for taking an active role in implementing source protection measures.** Examples of their good work include the following.

Watershed Control

The Water Division Supervisor has a good knowledge of, and stays aware of, conditions within the Zone Is, Zone IIs and the watershed, and workers are trained to observe watershed conditions while performing their jobs. The Supervisor has a protocol to ensure that proposed development projects within the watershed receive appropriate review by the Water Division.

Water Supply Education

The Water Division Supervisor 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 Water Division implement the following source protection measures.

- ✓ Work with local officials to control residential growth on undeveloped land.
- ✓ Educate residents about their role in drinking water protection.
- ✓ Post water supply awareness signs along roads in the Zone IIs and the watershed.
- ✓ Discourage birds from lingering at Old Oaken Bucket and at Tack Factory Pond.
- ✓ Continue with work to plan for emergencies, including spills and unplanned releases from roads and facilities in the protection areas.
- ✓ Work with emergency response teams to ensure that they are aware of the stormwater drainage in your Zone IIs and watershed.
- ✓ Conduct regular inspections of Zone II and watershed areas.
- ✓ Develop and implement a wellhead protection plan. DEP guidance to develop plans is available at <http://mass.gov/dep/brp/dws/protect.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 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	Comments/Recommendations
Zone I and Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone I and/or Zone A?	YES Zone I	Monitor Zone I activities.
	NO Zone A	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?	NO	Water supply awareness signs should be posted along roads in the Zone IIs and watershed. 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?	YES	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(2) and Wellhead Protection Controls that meet 310 CMR 22.21(2) ?	local bylaw is being updated	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 watershed and Zone II and provide recommendations on protection measures to town boards.
Planning		
Does the PWS have a local surface water and wellhead protection plan?	A surface water plan is under development.	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 Emergency Response Plan to deal with spills or other emergencies?	NO	Develop 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 team.
Does the municipality have a water supply protection committee?	NO	The Water Division Supervisor 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> .