Source Water Assessment and Protection (SWAP) Report for Cummington 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.

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 20, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	**Cummington Water Department**
PWS Address	**Cummington**
City/Town	**Cummington, Massachusetts**
PWS ID Number	**1069001**
Local Contact	**Donna Forgea**
Phone Number	**413-634-5358**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #3	1069001-03G	202 (radius)	507	High

Well Name	*Source ID#*	*Zone I (in feet)*	*MA GIS Zone II*	*Source Susceptibility*
Fanny Rogers Spring	1069001-04G	518 (square)	ID # 587	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 deicing, 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

Cummington is a small rural residential community located in the foothills of the Berkshires in western Massachusetts. The Cummington Water Department has 76 service connections in the center of the small community that serves residential homes, municipal buildings including the school, and several businesses. 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 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).

serves a total population of approximately 480 people. Well 03G, the main water supply source is a 50-foot deep, 10 x 18-inch diameter gravel packed well, located within the floodplain of the Westfield River, installed in August 1988. The source was approved through the New Source Approval Process for a withdrawal rate of 50 gallons per minute. The Zone I and Interim Wellhead Protection Area (IWPA) radii are 379 feet and 2,000 feet, respectively. The Zone I is the protected area immediately surrounding the wellhead while the IWPA provides an interim protection area for a water supply well when the recharge area has not been delineated. A Zone II, the actual recharge area has not been delineated for Well #3. The actual recharge area to the well may be significantly larger or smaller than the IWPA.

The Water Department also has a spring source, Fanny Rodgers Spring (04G). The Spring (04G) consists of two cisterns that flow by gravity to a third cistern that are all located within close proximity of each other. Water may then flow by gravity into the distribution system or is bypassed to waste. The spring water has received a low vulnerability rating through two rounds of Microscopic Particulate Analysis indicating the source is not significantly influenced by surface water. Although the spring water is regularly monitored for quality, the source remains active primarily as a back-up source because of the natural corrosivity of the water. If the Water Department intends to increase use of the spring system, it will be required to adjust the pH of the water for corrosion control to minimize the potential leaching of copper and lead from plumbing fixtures.

As part of the SWAP program, the United States Geological Survey (U.S.G.S.) was retained by the MA DEP to estimate the contributing area to public water supply springs through the use of geologic mapping. The U.S.G.S. determined the discharge from the springs by a combination of flow measurement and estimation of recharge, thereby estimating the maximum anticipated flow rate from the springs. The springs are located in a wooded area at the base of a slope. The Zone I and Zone II were based on an estimated maximum flow rate of 8 gallons per minute (gpm) from the spring system. The Zone I for a spring is a square oriented so that the sides of the box are parallel to groundwater flow. The spring is centered relative to the sides of the box and 50 feet upgradient of the downgradient edge of the box. For a flow rate of 8 gpm, the Zone I for the springs is a box with sides 518 feet in length.

Bedrock Well #1 (01G), located at the north end of the Main Street, is designated as an Emergency source of water. The well does not have a pump installed and all piping has

Table 2: Table of Activities within the Water Supply Protection Areas for Both Sources

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	Both	--	--	PWS does no own Zone I, non-conforming uses
Hazardous materials storage and use	Well #3	Well #3	High	Conduct inspects of facilities, encourage the use of BMPs and regulatory compliance. Coordination with emergency responders.
Auto repair garages	No	Well #3	Moderate	Hazardous materials/VSQG
High density residential w/septic	Well #3	Both	Moderate	Use BMPs for household hazardous waste, heating fuel, septic system management, and lawn care and stormwater runoff.

*** -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/.**

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

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
School	--	Well #3	Moderate /High	Use BMPs for household hazardous waste, septic system management, lawn care and stormwater runoff. Investigate fuel source at the school and inspect the boiler room for floor drains and their discharge point.
Highway Department garage, USTs and Closed Landfill	--	Well #3	High	Hazardous materials storage/VSQG and leaks and overfills of USTs, landfill leachate
Electric utility storage facility	--	Well #3	Moderate	Transformers, vehicles, etc.
Transportation corridor: local roads and State Route 9	Well #3	Both Sources	Moderate	Limit road salt usage and provide drainage downgradient from wells
Agricultural uses – pesticide, fertilizers, manure spreading	Well #3	Both Sources	High	Activities include haying, corn crop, and a dairy farm. Potential threats from pesticides, nutrients, petroleum products and 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 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.

been severed from the distribution system. Bedrock well #2 (02G) was located in the town garage and was abandoned and decommissioned several years ago. Wells #1 and #2 will not be address further in this report.

Bedrock in the area is mapped as the Goshen Formation consisting of two distinct units: one is interbedded quartzite and schist; the other is interbedded schist and phyllite. The springs are located at the base of a hill in a swampy area with an unknown thickness of peat. The recharge area is generally an upland area that is dominated by exposed bedrock or bedrock covered with a varying thickness of till (hardpan). Recharge to the springs is through the till and schist. The contributing area to the springs includes hay fields, cornfields, a few residences and a rural road. Due to the exposed bedrock and thin till, the springs are considered to have a high vulnerability to potential contamination from activities conducted on the land surface in the recharge area because of the lack of a protective barrier such as clay. Please refer to the attached map of the Zone 1 and Zone II for the spring.

As previously noted, Well #3 is located within the Westfield River valley, which is a narrow, buried bedrock valley, filled with glacially derived stratified drift (sand and gravel) and recent alluvial deposits. The aquifer is an unconfined sand and gravel deposit adjacent to the Westfield River; there is no record of a confining, protective clay layer in the vicinity of the well. Wells located in this type of geologic condition are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. The Town of Cummington has established an Aquifer Protection District and adopted protective Zoning Bylaws for that area. The Zone I and IWPA include much of the Main Street of Cummington, including a baseball field, municipal buildings, agricultural, commercial and residential uses as well as Route 9. Cummington does not have a municipal wastewater treatment plant and therefore all facilities dispose of wastewater through on-site septic disposal systems. Please refer to the attached map of the Zone I and IWPA.

For current information on water quality 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. Refer to Table 1 for additional information regarding the location of the well and activities within the protection areas.

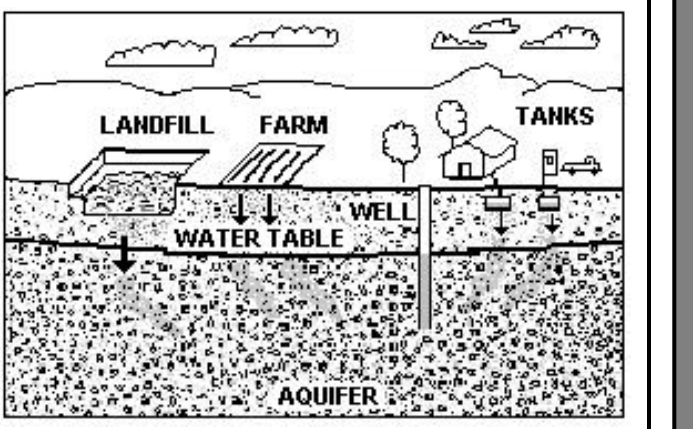

Figure 1: Example of how a well could become contaminated by different land uses and activities.

2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #3 (03G) include the entire town center for Cummington, which includes several activities that pose a threat water supply. The recharge area for the Fanny Rodgers Spring (04G) source includes agriculture and residential uses.

Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential/commercial land uses with on-site septic disposal**
3. **Transportation corridors,**
4. **Hazardous materials handling,**
5. **Agricultural uses,**
6. **Protection Planning.**

The overall ranking of susceptibility to contamination for the Cummington Water Department system is high, based on the presence of several high threat ranked land uses or activities in the Zone I, IWPA and Zone II. Please refer to Table 2 for more details.

The Town of Cummington is commended for adopting protective bylaws and for the Water Department's diligence in monitoring activities within the Zone I and IWPA. Continued monitoring and public outreach is recommended to prevent accidents and minimize threats within the protection areas of the wellhead and continue to pursue Zone I acquisition options.

1. Non-conforming activities within Zone I – Currently, the water supplier does not own or control the entire Zone I area for either source. Please note that systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I for Well #3 includes a baseball field, fire station, hardware store, a cornfield, the river, part of a dairy farm across the river and part of Main Street; the Zone I for the Fanny Rogers Spring includes a portion of a cornfield.

Recommendations:

- To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- Agreement Options - Until land is available for acquisition or preservation, attempt to obtain a Memorandum of Understanding and Right of First Refusal.
  - 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. A reference for a Right of First Refusal is included in the Appendices.
  - A Conservation Restriction is also a legal document that limits the type of activities that can be conducted on the property to those associated that do not pose a significant threat to the water supply.
- Where it is feasible, remove all hazardous materials from the Zone I of Well #3. Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals, maintenance chemicals and vehicles used to access the area.
- Do not use or store pesticides, fertilizers or road deicing materials within the Zone I.
- Ensure that residents and commercial facilities are aware of best management practices (BMPs) with respect to hazardous materials handling, household hazardous materials handling and disposal and proper use of lawn chemicals.
- Carefully monitor the delivery, handling and storage of chemicals and products at facilities within the Zone I.

For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 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.

2. Residential Land Uses – The Zone I and IWPA for Well #3 has high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **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 and accidents during delivery.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. 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. Visit the Nonpoint Source pollution web site for additional information at http://www.state.ma.us/dep/brp/wm/nonpoint.htm.

Residential Land Use Recommendations:

V 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.

3. Transportation corridors – Numerous roads are located within the Zone I, IWPA and Zone II. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

Recommendations:

V Work with the State Highway Department and the Town Highway Department to determine the location and discharge points of road runoff as is feasible. If reasonable, discharge stormwater to discharge downgradient of the well.

V Review potential USDA funding for mitigation and prevention of runoff pollution through the Environmental Quality Incentives Program (EQIP). For more information, call the local office in Hadley at 413-585-1000 or visit the U.S.D.A. web site at www.ruraldev.usda.gov. Fact sheets are also available online at http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf.

V Prepare an Emergency Response Plan that includes coordination between the DEP, the Water Department the Town and State Police in the event of an accident near the wellhead.

4. Hazardous Materials Storage and Use – There are a few commercial, municipal and utility facilities within the protection areas of Well #3 that store or utilize hazardous materials. Many businesses use hazardous materials, produce hazardous waste products, and/or store large quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. Review the attached fact sheet for additional information about vehicle washing activities.

Hazardous Materials Storage and Use Recommendations:

V Educate local businesses and municipal departments regarding the use of best management practices for protecting water supplies. Distribute the fact sheets "Businesses Protect Drinking Water" and "DPWs Protect Drinking Water" available in Appendix A; it is also available online at the website www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.

V Work with the local Board of Health, the municipality and businesses to register 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 and town officials and assist the Board of Health in understanding the Massachusetts and local floordrain requirements. See the brochure "Industrial Floor Drains" for more information.
- The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities in small communities through programs such as those listed on the USDA web site at http://search.sc.egov.usda.gov/. Additional information is available on the web site www.ruraldev.usda.gov or call the local office in Hadley at 413-585-1000.

5. Agricultural Activities – A small percentage, of the IWPA and most of the Zone II areas are in agricultural land use. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. Frequently, farms and other large commercial facilities have maintenance garages for equipment and storage tanks. If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the products they store.

Agricultural Activities Recommendations:

- Inform commercial farmers in your protection areas of your water supply protection area and encourage them to work with (or continue working with) the USDA Natural Resources Conservation Service (NRCS) and to have a farm plan to protect water supplies. Recommend that water suppliers and farmers review the fact sheets available online at http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf and call the local office of the NRCS in Hadley at 413-585-1000, for assistance as is appropriate.
- Encourage farmers and any large commercial property owners to incorporate an Integrated Pest Management (IPM) approach into their pest (plant and insect) 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. The Department of Agricultural Resources regulates the use of pesticides.
- Very often farms and large commercial properties store maintenance equipment and associated petroleum products on site. Promote the use of BMPs for fuel storage, hazardous material handling, storage, disposal, and emergency response planning.
- Consider providing hobby farmers with information about protecting their own wells and the public water supply by encouraging the use of BMPs. For additional resources, refer to http://www.state.ma.us/dep/brp/dws/dwspubs.htm and http://www.state.ma.us/dep/consumer/animal.htm#dwqual. The Planning Board, Board of Health and Conservation Commission may be able to provide information on BMPs to hobby farmers as well.

6. Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Cummington does have a protective bylaw that includes part of the Town center area. Cummington also was awarded a Wellhead Protection Grant to prepare a protection plan for the community. 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:

- Prepare a Wellhead Protection Plan and establish a protection team. Refer to http://mass.gov/dep/brp/dws/protect.htm for a copy of DEP's guidance, "Developing a Local Wellhead Protection Plan" and continue current efforts in wellhead protection planning.
- For long term planning, the Water Department may wish to consider having the Zone II delineated for Well #3 to assist in focusing protection efforts. Perhaps, the Department can collaborate with the West Cummington Department to have Conceptual Zone II delineations completed for both systems' wells.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The West Cummington Water Department should review and adopt the key recommendations above and the following:

Priority Recommendations:

- Continue efforts to acquire ownership or control of Zone I and limit access to the well.
- Consider having the Zone II delineated for Well #3 to focus protection measures on areas that contribute directly to the well.
- Continue to conduct detailed inspections of the IWPA to monitor activities near the well.

Zone I:

- Keep non-water supply activities out of the Zone I.
- Use BMPs within the Zone I for treatment chemicals and
- Prohibit public access to the well and pump house with locking facilities, gating roads, and posting signs as appropriate.
- Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or 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, a Memorandum of Understanding or a Right of First Refusal to purchase the property.
- Redirect road drainage in the Zone I away from well area.
- 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 away from the immediate wellhead area.
- Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- Keep the area near transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- Work with local officials in Cummington to review Aquifer Protection District Bylaws for compliance with 310 CMR 22.000 and to include the West Cummington supply IWPA in that district.
- 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 in the event of an emergency.
- 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.
- Work with the Board of Health to adopt floor drain regulations and hazardous materials handling regulations. Include an inspection program for facilities that handle hazardous materials.
- Have the highway department review their status as a hazardous waste generator and register as appropriate.

Funding:

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 USDA also has various funding sources for government, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available online at http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf and call the local office (Hadley 413-585-1000) of the NRCS for assistance.

These recommendations are only part of your ongoing local drinking water source protection. 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 sheets
- List of Regulated facilities in the protection areas

ATTACHMENT

REGULATED FACILITIES WITHIN OR IMMEDIATELY ADJACENT TO THE WATER SUPPLY PROTECTION AREAS

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
	Cummington Garage	Main Street	Cummington	Hazardous Waste Generator	Very Small Hazardous Waste Generator	Auto Repair
	Western Mass. Electric Co.	Fairgrounds Road	Cummington	Hazardous Waste Generator / Waste Oil	Very Small Hazardous Waste Generator	Electric Utility Maintenance / Storage Facility

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.

Underground Storage Tanks in are adjacent to protection areas

Facility Name	Address	Town	Description	Tank Type	Tank Leak Detection	Capacity (gal)	Contents
Town Garage	Fairgrounds Road	Cummington	DPW	2 Wall	Interstitial Monitoring	2,000	Gasoline
				2 Wall	Interstitial Monitoring	2,000	Diesel