



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Pioneer Valley Regional School District

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

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Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Pioneer Valley Regional School District
<i>PWS Address</i>	97 F S Turner Road
<i>City/Town</i>	Northfield, Massachusetts
<i>PWS ID Number</i>	1217002
<i>Local Contact</i>	Mr. Stephen Field
<i>Phone Number</i>	413-498-2931

<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	1217002-01G	279	744	Moderate/High

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 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

Description of the Water System

The Pioneer Valley Regional School (the school) is located in the west central section of Northfield. Northfield is a small rural town in northwestern Massachusetts along the Vermont and New Hampshire border. The facility consists of two major school wings located adjacent to each other serving seventh through twelfth grade; the wings are attached to each other. The total school student and staff population is approximately 625 people per day. Although there are two municipal water systems and a wastewater treatment facility in Northfield, they do not serve the area where the school is located.

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.

Therefore, the school and surrounding facilities are served by on-site water supplies and septic disposal.

The school is served by one potable supply well (Well #1 – 01G), 6-inch diameter, 350-feet deep, bedrock well that is located approximately 700 feet west of the school. The original shallow gravel developed wells for the school are located approximately 300 feet west of the currently active well. The gravel wells were abandoned as potable supplies in 1986 when Well #1 was installed under the DEP New Source Approval Process. The original gravel wells were not physically decommissioned and remain intact. The motor control building also still exists, however, during the recent renovation and school expansion project, the motor controls for the well were relocated from the old building into the school. In the most recent Sanitary Survey of the system conducted in August 2003, the DEP also recommended that capital planning include funds for decommissioning the original wells because the wells are adjacent to a wetland that is subject to flooding.

The school is located on the western edge of the Connecticut River valley at the base of the Berkshire foothills. Geologic mapping indicates overburden deposits of approximately 50 feet of sand and gravel with some amount of till over bedrock at the school. The school is located immediately west of an area mapped as potential, medium yield, sand and gravel aquifer. This valley area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 18,000 years ago. The bedrock in the immediate area of Well #1 is mapped as feldsicc gneiss of the Partridge Formation.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or other non-threatening activities are allowed to occur. The

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

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	-	-	-	UST w/leak detection at school just outside of the IWPA
Floor Drains in Boiler Rooms to septic	No	Yes	Moderate	Presently working with DEP UIC and wastewater programs regarding compliance
Agriculture/Athletic fields	No	Yes	Moderate	Continue prohibiting the use of pesticides/fertilizers on school fields. Refer farmers to DAR and NRCS regarding IPM
School (Middle and High Schools)	No	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Low density residential housing	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel
Septic systems components	No	Yes	Moderate	Residential and part of the school's wastewater components are in the IWPA; the school leachfield is not in the IWPA
Hazardous materials	No	Yes	Moderate/High	Maintenance hazardous materials and laboratory waste
Transformers	No	Both	Low	Monitor transformers for potential leaks
Aquatic wildlife (beavers)	Yes	Yes	Moderate/High	Protect the wells from being inundated

-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.

Interim Wellhead Protection Area (IWPA) is a larger area that potentially contributes water to the well. The IWPA is only an interim protection area until an actual Zone II contribution area is delineated; the actual area of contribution to the wellhead may be larger or smaller than the IWPA. The well has a Zone I protective radius of 279 feet and an IWPA protective radius of 744 feet. These protective radii were approved at the time the well was installed based on the capacity of the well and Zone I ownership restrictions. Please refer to the attached map that shows the Zone I and IWPA.

There is no evidence of a continuous, protective confining layer such in the vicinity of the well. Wells drilled in these conditions are considered highly vulnerable to potential contamination from activities on the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the aquifer. Although there have been periodic detections of dichloromethane and chloromethane in the water, the concentrations have never exceeded any regulatory thresholds. The source of these constituents is not known. Therefore, the water is not treated prior to distribution. You may request additional information regarding the quality of the water, from the local contact listed in Table 1.

Please refer to the following section, attached maps of the Zone I and IWPA and Table 2 for additional assessment information.

2. Discussion of Land Uses in the Protection Areas

During the assessment, several land uses and activities were identified within the drinking water supply protection areas and in close proximity to the protection areas that are potential sources of contamination.

Key issues include:

1. **Non-conforming Zone I;**
2. **Underground storage tanks (outside of protection area);**
3. **Floor drains in boiler rooms;**
4. **School facilities and athletic fields;**
5. **Transportation corridors/parking; and**
6. **Hazardous materials.**

There are several activities within the Zone I and IWPA that pose a potential threat to the water supply. The overall ranking of susceptibility to contamination for the well is moderate/high based on at least one high threat activity within the protection areas. Please refer to Table 2.

1. Non-conforming Zone I – The water supplier does not own or control the entire Zone I area for the well, however, the only activities in the Zone I are passive recreation and a periodic beaver population in the nearby wetland. Systems not meeting DEP Zone I requirements for ownership or control or non-conforming activities within Zone I must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Zone I Recommendations:

- ✓ Prohibit any non-water supply activities within Zone I and, where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Do not use or store pesticides or fertilizers in Zone I.

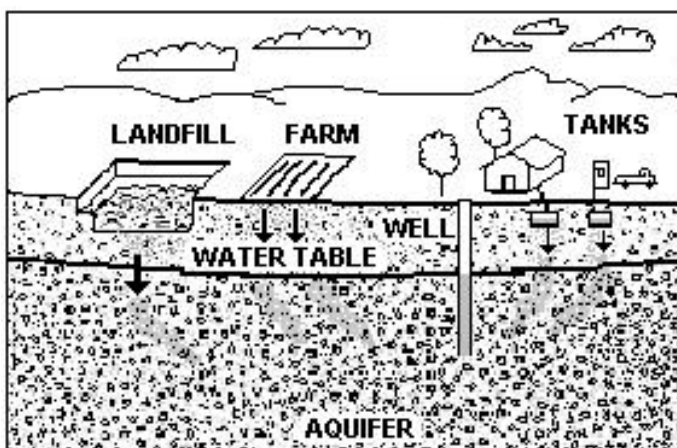


Figure 1: Example of how a well could become contaminated by different land uses and activities.

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 More Information:

Contact Catherine V. Skiba in DEP's Springfield Regional 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 provided to the public water supplier, town boards, the town library and the local media.

- ✓ Control beaver activity near the well to protect it from inundation.
- ✓ Inspect the well regularly to ensure the cap is secure and there is no standing water near the well.

2. Underground fuel oil storage – There is a fuel oil UST just outside of the IWPA. Since the actual recharge area of the well has not been delineated, this report includes activities that may pose a threat even though they are just outside of the protection areas. If managed improperly, fuel oil tanks and their associated piping can be a potential source of contamination due to leaks or spills of the materials they store.

Recommendation:

- ✓ Any modifications to the tank 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 and USTs.
- ✓ Monitor all activities associated with the fuel oil, especially delivery.
- ✓ Have spill containment/absorbent materials available on-site

3. Floor Drains in Boiler Room – There are floor drains in the boiler room, that discharge to the septic system. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain. The school is presently required to address the floor drain by the DEP and is working with the Department to resolve the issue.

Recommendations:

- ✓ Continue to work with the Department UIC and wastewater program staff.
- ✓ Consider containment to prevent accidental releases to the floor drain. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.
- ✓ Seal any cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

4. School facilities and athletic fields – Elementary and middle schools generally use only household type hazardous materials. However, high school laboratory and photo labs can use potentially harmful materials and the school does not have a tight tank for the laboratory waste. Title 5 prohibits the disposal of any wastewater other than sanitary waste to the septic system. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the IWPA of the well. Potential exists for contamination of the well by onsite use of fertilizers or pesticides, which can be of concern. Storm drains in the parking areas at the school drain directly into the ground. The high school does use micro-pipeting techniques to minimize laboratory waste.

Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields across the street. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment as necessary for any petroleum products kept for maintenance and lawn care equipment.
- ✓ Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides or fertilizers within Zone I.

- V Review your emergency response plan regarding to accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- V For additional information, refer to the Massachusetts Public Health Associations Healthy Schools website online at http://www.mphaweb.org/pol_schools.html.

5. Transportation corridor/parking – The school’s internal transportation corridors and parking are located within the IWPA. A railroad line is also located on the extreme edge of the IWPA. Accidents and normal use and maintenance of corridors and parking areas may 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 Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.

6. Hazardous Materials Storage and Use – The school utilizes hazardous materials for maintenance and in the laboratories. Hazardous materials such as paint, thinners, petroleum products, etc. should be kept in containment and used with caution. Cleaning and disposal should not be through the septic system. Spill kits and signs designating areas of storage should be available. 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. Review the attached fact sheet for additional information regarding the thresholds for triggering a very small quantity hazardous waste generator. The school does have a tight tank for the laboratory wastes.

Hazardous Materials Storage and Use Recommendations:

- V Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.
- V Continue to use BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- V Maintain the tight tanks as appropriate.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well’s susceptibility to contamination. The DEP commends the effort shown in current protection practices of not using pesticides and fertilizers in the Zone I. The school district should comment to the various town boards regarding developments that may impact the school’s well.

Please review and adopt the key recommendations listed above and as follows:

Priority Recommendations:

- V Communication with the Town boards and emergency responders regarding the location of the well and the protection areas.

Zone I and IWPA:

- V Prohibit any new non-water supply activities from Zone I.
- V Conduct regular inspections of the Zone I and IWPA.
- V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the well.
- V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lab chemicals, lawn care chemicals and fertilizers.
- V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, lab chemicals, pesticides and household hazardous waste.

Training and Education:

- V Incorporate groundwater education into school curriculum (7-12 curricula available; contact DEP for copies).
- V Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and the certified operator.

Facilities Management:

- V Staff should be instructed on the proper disposal of spent household chemicals and or lab chemicals. Include custodial staff, groundskeepers, and the certified operator. In order to participate in a Community Hazardous Waste Pick-up day, the school must be registered as a Very Small Quantity Generator. The school is currently not registered as a generator of hazardous waste or waste oil. Review the enclosed document "A SUMMARY OF REQUIREMENTS FOR SMALL QUANTITY GENERATORS OF HAZARDOUS WASTE" and register to participate, if necessary.
- V Continue to work with the Department regarding compliance of the floor drains in the boiler room.

Planning:

- V Work with local officials to develop an Aquifer Protection District Bylaw that includes the school well's IWPA and to assist you in continued protection of the water supply.
- 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.
- V 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 "Wellhead Protection Grant Program". If funds are available, the Department posts a new Request for Response (RFR), grant application form. Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" on the MA DEP website 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 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
- Very Small Quantity Generator (VSQG) information