



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report For Hawlemont Regional 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

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Table 1: Public Water System (PWS) Information

PWS Name	Hawlemont Regional Elementary School
PWS Address	10 School Street
City/Town	Charlemont, Massachusetts
PWS ID Number	1053007
Local Contact	Mr. Paul Dinicolantonio
Phone Number	413-339-8316

Well Name	Source ID#	Zone I (in feet)	IWPA (in feet)	Source Susceptibility
Well No. 1	1053007-01G	134	437	High
Well No. 2	1053007-02G	134	437	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies 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 in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

The Hawlemont Regional Elementary School is located in the small, rural town of Charlemont, in northwest Massachusetts on the Mohawk Trail (State Route 2). The school has a student and staff population of approximately 210 people. There is no municipal water system in Charlemont but there is a wastewater treatment plant that serves the center of town, including the school. Therefore, the school discharges wastewater to the treatment plant but water is supplied to the school through two on-site wells. Well #1 (01G) is the main water source for the school; Well #2 is physically

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).

disconnected from the system but the water quality is regularly monitored and remains a potentially active source. The use of Well #2 was discontinued in 1999 when low concentrations of the volatile organic compounds tetrachloroethylene (PCE) and trichloroethylene (TCE) were detected in water samples collected from Well #2; the compounds were not detected in Well #1. Although the concentrations did not exceed the maximum concentration limits set by DEP and Environmental Protection Agency (EPA), the school does not use the well but continues to monitor the water quality. Although the compounds have not been detected in the water from Well #2 since the Spring of 2000, the school does not use the well. Water quality in both wells is regularly monitored and the school and DEP have an agreement that if the water quality becomes impaired in Well #1, the school will develop an alternative water source.

The school is located south of Route 2 and the Deerfield River bounds the school property on the south. The school is located in the center of town with residences and businesses surrounding the area. Generally, the DEP requires development of a new source that is in compliance with current regulations if a system with a non-conforming source expands. However, due to site constraints and good water quality in the existing Well #1, renovations and an expansion of the school were recently completed, with the school maintaining the use of the existing wells provided the water quality is not impaired. Well #1, the main source is an 8-inch diameter, gravel developed well, screened from 90 to 95 feet below grade that is located in the basement of the building in the boiler room. The school will be installing a berm around the well to prevent inundation of the well if a release occurs in the basement. Well #2 is located within an 8x5x5-feet deep concrete bulkhead, west of the school.

The school is within the Deerfield River valley at the base of the Berkshire foothills between Rice Brook and Mill Brook. The surficial geology at the school site is glacial drift, sand and gravel, deposited within a glacially deepened bedrock valley. Receding glaciers deposited the sand and gravel some 18,000 years ago. In fact there is a delta at the outlet of the Mill Brook as it enters the Deerfield River valley. The deposits within the valley have been reworked by recent streams and rivers with additional recent alluvium deposited by the river. Information from the school indicates sand and gravel to at least 95 feet below grade. However, there is no record of a clay-confining unit in the area. The topography rises dramatically north of the river valley and Route 2. The hillsides north of the school generally have thin till over bedrock. The bedrock at the school is mapped as bands of the Hawley Formation; interbedded amphibolite, greenstone and schist and just east of the school is a mapped contact with a black, fine-

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

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to expanding the facility or conducting any work in the Zone I.
Fuel oil storage (UST/AST)	Yes	Yes	High/Moderate	Spills, leaks, or improper handling of fuel oil
Transportation corridors and parking	Yes	Yes	Moderate	Be sure emergency responders are aware of the location of your wells.
Residential land uses	Yes	Yes	Moderate	Nitrates, microbial contaminants, and improper disposal of hazardous chemicals
School	Yes	Yes	Moderate	Continue policy of not using pesticides and fertilizers
Commercial/Institution uses	Yes	Yes	Moderate	Household/commercial hazardous materials: recommend BMPs

* -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.

grained schist and quartzite interbedded with amphibolite. There is no empirical evidence of a protective clay layer or thick till to prevent activities on the ground surface from threatening the water supplies. In fact, the very low levels of VOCs were detected in water from the bedrock well on site. Therefore, both the bedrock and the sand and gravel aquifers are identified as having high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration.

The Zone I is the area immediately around the well that is considered most vulnerable to contamination. The Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The DEP allows only activities related to supplying water or other non-threatening activities within the Zone I. Many systems that were developed prior to the DEP requirements are grandfathered, but any expansion or changes to the facility require DEP approval and compliance with Zone I restrictions. As noted, the DEP allowed the school to expand and to continue using the non-conforming Well #1 until such time that the water quality is impacted from activities near the well. The Zone I and IWPA for both wells are the same. The Zone I and IWPA were based on estimated water use from the wells. The Zone I and IWPA radii for both wells are 134 feet and 437 feet, respectively. The school has installed a meter on Well #1 in 2001 and a preliminary review of the data indicates the school actually uses less water than was initially based on Title 5 flow estimates. Upon review of two full years of water metered data following the school renovation project, the DEP may reduce the size of the protection areas based on actual metered use. Please refer to the attached map of the Zone I and IWPA.

The protection areas for the school's wells include many activities that pose a potential risk of contamination. There are also activities that are just outside of the protection areas that may pose a significant threat to the wells if not managed. All of the school facilities, including an underground fuel oil storage tank, are located within the Zone I or IWPA of one of the wells. As noted previously, the school discharges all of its wastewater to the municipal sewer. If funding becomes available, the school may wish to consider delineating the Zone II recharge area for Well #2 so that the protection strategy for the well can be more focused and perhaps identify a potential location for a new source if one is required in the future.

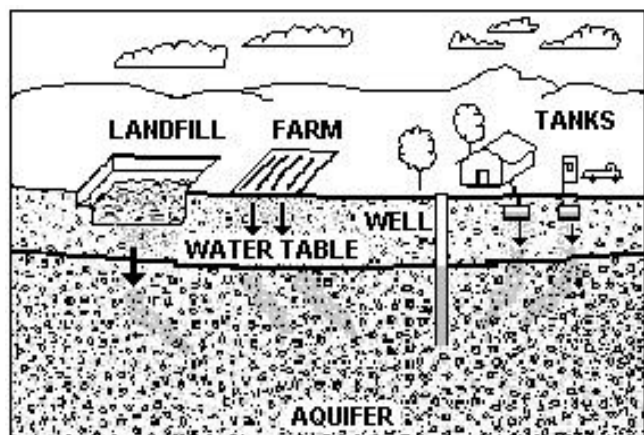


Figure 1: Example of how a well could become contaminated by different land uses and activities.

The well serving the school 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 EPA's at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html, for Envirofacts.

2. Discussion of Land Uses in the Protection Areas

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

For More Information:

Contact Catherine 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 and town boards.

Key issues include:

1. **Non-conforming Zone Is;**
2. **Elementary School;**
3. **Fuel storage tanks (UST/AST);**
4. **Commercial businesses;**
5. **Transportation and parking; and**
6. **Residential.**

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 protection areas, as seen in Table 2.

1. Non-conforming Zone I – Currently, the wells do not meet DEP's restrictions, which require the system to own or control the entire Zone I area and allow only water supply related or other non-threatening activities in Zone I. The school's Zone Is include all school facilities including a fuel oil underground storage tank (01G). The tank was relocated as part of the renovation and is a new tank with leak detection. Systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying the system's facilities.

Recommendations:

- ✓ Do not allow any new non-water supply activities in the Zone I.
- ✓ Monitor and control all activities near both wells.
- ✓ Monitor all fuel deliveries.

2. School facilities and athletic fields – Elementary schools generally use only household hazardous materials for cleaning. 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 Zone I or IWPA of the wells. However, municipal sewer serves the facility.

Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use fertilizers and pesticides in the Zone Is.
- ✓ Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- ✓ Use secondary containment 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, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website for additional information, online at http://www.mphaweb.org/pol_schools.html.

3. Fuel Oil Storage – Underground/Aboveground Storage Tank (UST/AST) – Although the UST fuel oil tank is new the UST can pose a potential threat to the water supply because of potential leaks and/or releases especially during delivery. If managed improperly, underground storage tanks and the associated fuel oil lines can be a potential source of contamination due to leaks or spills of the chemicals they store. The school also has a propane AST which does not pose as significant a threat as the fuel oil UST. In addition, there are commercial and residential facilities that are within close proximity to the school that use various types of fuel for heating including oil, propane, kerosene or wood.

Recommendations:

- ✓ Any modifications to the UST/AST must be accomplished in a manner consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.

- ✓ Monitor deliveries of oil as many spills are related to delivery.
- ✓ Be sure that the floor drains are running freely and are connected to the municipal wastewater treatment facility.
- ✓ Containment of the fuel system to prevent accidental releases to the floor is important. 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 that your boiler maintenance contractor use containment, protect the well 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 all cracks in the floor to adequately protect the well.

3. Residential Land Uses – There is an apartment complex immediately adjacent to the school and there is at least one other apartment building and approximately twelve other residences within the protection areas of the wells. It is assumed that all are connected to the municipal sewer. However, it is unknown what fuel sources the surrounding residences utilize. 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/Kerosene Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil/kerosene 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” attached to this report and on-line at the following DEP website which provides BMPs for common residential issues: www.mass.gov/dep/brp/dws/protect.htm.
- ✓ Promote BMPs for stormwater management and pollution controls.

4. Transportation corridor/parking – Mohawk Trail (State Route 2), residential, commercial and facility parking are located within the Zone I and 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:

- ✓ Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well.
- ✓ Continue to manage on-site and off-site stormwater to ensure it flows away from the wells.

5. Commercial facilities - There are commercial/institutional facilities located within the IWPA of the school wells. The facilities include restaurants, a church, a general store and a hardware store. The town’s Fire Department is also on the edge of the IWPA for Well #1. Some businesses use or store hazardous materials or generate hazardous waste. 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.

Recommendations:

- ✓ Inform the businesses that your PWS is nearby and offer information regarding the use of BMPs at their facilities.

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. The school is commended for not using pesticides and fertilizers on its athletic fields and for continuing to monitor the quality of the water in Well #1. The water supplier should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Monitor fuel oil delivery and activities within close proximity to the wells. Do not use or store hazardous materials in the vicinity of the wells.

Zone I:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Post the area with “Public Drinking Water Supply Recharge Area” signs at appropriate locations away from the actual wells.
- ✓ Consider well relocation if Zone I threats cannot be mitigated or if water quality is impacted by activities. Consider delineating the Zone II for the existing well and utilizing that information to potentially site a new well if it is needed for the future.

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 the school curriculum and community.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the area and is treated according to DEP guidance.

Facilities Management:

- ✓ If it is feasible in the future, consider upgrading the heating system to propane for the purpose of removing fuel oil storage from the school.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Keep the area near transformers free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Work with local officials in town to develop an Aquifer Protection District with bylaws and include the facility’s IWPA in the District, along with other public water supply wells in town 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.
- ✓ The school may wish to consider delineating the Zone II for the sand and gravel Well #1. This would allow for a more focused protection plan and may result in identifying an alternative site that may be protected for a new well should it become necessary in the future.

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”. If funding is available, 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 encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet