



Massachusetts Department of Environmental Protection

Source Water Assessment Program (SWAP) Report

for Brimfield Elementary School

What is SWAP?

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

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

SWAP and Water Quality

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

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

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

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Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Brimfield Elementary School
<i>PWS Address</i>	22 Wales Road
<i>City/Town</i>	Brimfield, Massachusetts
<i>PWS ID Number</i>	1043014
<i>Local Contact</i>	Mr. Peter Silverman
<i>Phone Number</i>	413-245-7337

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #2	1043014-02G	250	736	High

Introduction

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

Purpose of this report:

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

This report includes:

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

Description of the Water System

The Brimfield Elementary School (the school) is located in the central portion of Brimfield just south of the Town center on Route 19. The school student and staff population is approximately 415 people per day and the school is served by one potable supply well (Well #2-02G). Well #1 is severed from the distribution system but the school maintains Well #1 as an emergency source. The emergency source will not be further addressed in this report. Well #2 was installed to replace Well #1 in 1992 as part of a school expansion and upgrade project. The well is located southwest of the school on the edge of the ball field. There is no municipal wastewater sewer system in

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.

Brimfield; therefore, the school and surrounding facilities are served by on-site septic disposal.

Well #1 is an 8-inch diameter, bedrock well that is 466 feet deep. Geologic mapping in the area and the well log indicates overburden deposits of 124 feet of sand with some till over the bedrock. The school is located in an area that is mapped as a potential, medium yield, sand and gravel aquifer. The area is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers about 14,000 to 18,000 years ago.

The Zone I is the area immediately around the wellhead where only activities associated with supplying water or non-threatening activities are allowed to occur. The 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 Zone I and IWPA protective area radii are 250 and 736 feet, respectively. These protective radii were calculated based on the approved withdrawal rate of the well which was based on a 48-hour pumping test conducted during the New Source Approval Process. Please refer to the attached map that shows the Zone I and IWPA.

The Zone I area for the well is conforming to current DEP requirements. The Zone I area for Well #2 includes the playing fields for the school. DEP approved the activity provide no pesticides and fertilizers are used on the fields. The leachfield is located just outside Zone I. All of the school building and facilities, two USTs, three leachfields, the fire station, the DPW Highway garage and part of the Brimfield Housing Authority facilities are also located within the IWPA.

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

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments/threats
USTs (1 gasoline, 1 fuel oil)	No	Yes	High	UST w/leak detection at school and fire station
Floor Drains in Boiler Rooms	No	Yes	Moderate	Consult with UIC program regarding compliance
Athletic fields	Yes	Yes	Moderate	Continue current practice of prohibiting the use of pesticides/fertilizers on fields
School facilities and parking	No	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
High density residential housing	No	Yes	Moderate	Septic systems, household hazardous materials and parking
Transportation Corridor	No	Yes	Moderate	Wales Road (Rt. 19)
Fire Station	No	Yes	Moderate	Vehicle washing and vehicle storage
Septic systems components	No	Yes	Moderate	School housing authority and DPW leachfields in the IWPA
Highway Department - VSQG	No	Yes	Moderate	Hazardous materials storage and use and recycling center

-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.

Geological mapping of the area indicates the metamorphic bedrock aquifer that the well taps is quartzofeldspathic gneiss and sillimanite schist from the Hamilton Reservoir Formation of the Brimfield Group. Stratified drift deposits (sand and gravel) of undetermined thickness overlay the bedrock in this area. During the site visit, some shallow, sand and gravel residential and public supply wells were observed in the vicinity of the school. Although the actual depth to bedrock is not known, anecdotal information indicates the sand and gravel over the bedrock is greater than 20 feet in thickness.

Although there is some sand and gravel (approximately 124 feet) material overlying the bedrock aquifer utilized by the school, the sand and gravel is highly porous. Sand and gravel does not provide a significant hydrogeologic barrier to prevent contaminant migration from the ground surface into the bedrock aquifer. There is no evidence of a continuous, protective confining clay layer in the vicinity of the wells. 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. The water does not require and is, at the time this report was prepared, not treated. 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. Please note that the land use descriptions are limited and the school area is described as Urban Open space for lack of a better descriptor.

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 that are potential sources of contamination.

Key issues include:

1. **Zone I**
2. **Floor drains in boiler rooms,**
3. **School facilities and athletic fields,**
4. **Residential housing,**
5. **Transportation corridors and right of ways,**
6. **Underground Storage Tanks**
7. **Hazardous materials/waste**

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

1. **Zone I** – The water supplier does own the entire Zone I area. The Zone I includes a ball field.

Zone I Recommendations:

- ✓ Prohibit any additional activities within Zone I and where feasible, remove non-conforming activities within the Zone I areas.
- ✓ Use Best Management Practices for maintenance and access to the area.
- ✓ Do not use or store pesticides or fertilizers within the

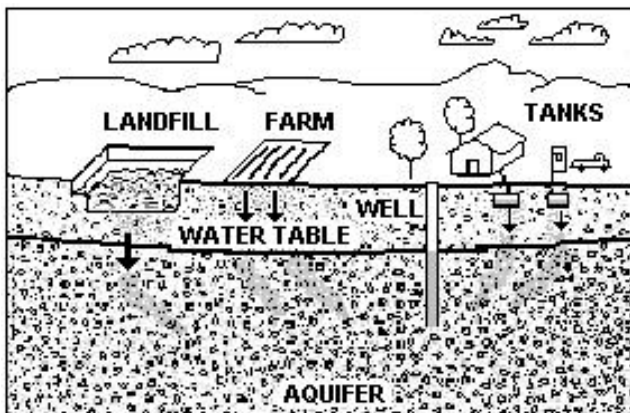


Figure 1: Example of how a well could become contaminated by different land uses and activities.

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.

Zone I.

2. Floor Drains in Boiler Room – There are floor drains in the boiler room, that are assumed to discharge to the septic system. However, the discharge point is not known. 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.

Recommendations:

- ✓ Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
 - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207 or Tony Zaharias 413-755-2122).
- ✓ Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the UIC program listed above. 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. We recommend that you require your boiler maintenance contractor to 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 the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

3. School facilities and athletic fields – Elementary schools generally use only household type 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. Potential exists for contamination of the well by onsite use of fertilizers and/or pesticides; continue to prohibit their use in Zone I. Storm drains in the parking areas at the school drain directly into the ground.

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.
- ✓ 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, fertilizers or deicing materials within Zone I.
- ✓ Review your emergency response plan regarding accidental releases within the area. Ensuring that emergency responders in town are aware of the locations of your resource areas.
- ✓ Refer to the Massachusetts Public Health Associations Healthy Schools website online at http://www.mphaweb.org/pol_schools.html for additional information.

4. Residential Land Use – There is high-density residential housing at the Brimfield Housing Authority within the IWPA protection area. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Septic Systems** – Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground 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 automobile leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information and assistance 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.

5. Transportation corridors and parking - Roads and parking areas are potential sources of contamination due to deicing of roadways and leaks or spills of fuels and other hazardous materials during accidents.

Recommendation:

- V Contact the local fire department to ensure that the Zone I and IWPA areas are included in Emergency Response Planning.

6. Underground Storage Tank (UST) – The school has a 10,000-gallon double-walled, UST with fuel oil and the Fire Department has an UST with gasoline; both are located within the IWPA of the water supply. If managed improperly, Underground Storage Tanks can be a potential source of contamination due to leaks or spills of the chemicals they store. Both tanks are relatively new and have leak detection.

Recommendation:

- V Any modifications to the UST must be accomplished in a manner consistent with Massachusetts’s plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs. Monitor all activities associated with the products especially during delivery.

7. Hazardous Materials Storage and Use – The Brimfield Highway Department, Fire Department and recycling facilities are located within the IWPA. The Highway Department is a registered hazardous waste (oil) generator. There were no floor drains observed during the assessment and the hazardous materials appeared to be handled appropriately. 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. It should be noted that vehicle washing is a restricted activity under the UIC regulations. In addition, there are vehicles stored on site. There is also a well that serves the facility northwest of the garage and it’s cap was loose at the time of the assessment. The cap on the well should be inspected and changed to a watertight cap with a sanitary seal.

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 Review the attached fact sheet for additional information about vehicle washing activities.
- V Continue to manage any vehicles that are stored on site to ensure there is no leakage of petroleum products.
- V Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.

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.

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

Priority Recommendations:

- ✓ Request that the Town departments monitor their well and continue to use BMPs for management of hazardous materials in the protection areas.

Zone I and IWPA:

- ✓ Prohibit any new non-water supply activities from Zone I.
- ✓ Continue to conduct regular inspections of the Zone I and IWPA.
- ✓ Monitor activities and if there is evidence of increased activity or access to the well, consider limiting access with a fence. Inspect the cap to ensure the integrity of the seal.
- ✓ Post drinking water supply signs in key locations such as along the access road and in the parking areas but away from the wells themselves.
- ✓ Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

Training and Education:

- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).
- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and certified operator.

Facilities Management:

- ✓ Staff should be instructed on the proper disposal of spent household 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.

Planning:

- ✓ 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.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts.
- ✓ Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Grant Protection Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "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
- UIC/Industrial Floor Drain
- Very Small Quantity Generator (VSQG) information