



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Gale Brook 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>	Gale Brook School
<i>PWS Address</i>	Athol Road
<i>City/Town</i>	Orange, Massachusetts
<i>PWS ID Number</i>	1223010
<i>Local Contact</i>	Mr. James Majewski
<i>Phone Number</i>	1-888-377-7678

<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	1223010-01G	100	401	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 Gale Brook School (the school) is located on the corner of Athol Road and Royalston Road in North Orange. Orange is a medium to large size town in northwestern Massachusetts, north of Quabbin reservoir. The school well serves the school and the library that is located on the same parcel. The school is home to the Head Start Program preschool. The total school student and staff population is less than 50 people per day. Although there is a municipal water system and a wastewater treatment facility in Orange, they do not serve the area where the school is located. Therefore, the school and surrounding facilities are served by on-site water supplies and septic disposal.

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.

The school is served by one potable supply well. Well #1-01G is a 6-inch diameter, 400-foot deep, bedrock well that is located beneath a bulkhead that can be accessed through the basement of the school. There are 2275 gallon fuel oil tanks within containment in the basement along with the boiler; the floor drain in the basement was redirected to a surface discharge. The library has an underground fuel oil storage tank that the Town intends to remove when funding is available. There are two roads and several private homes within the IWPA.

The school is located on the southeast flank of Temple Hill, southeast of Whites Pond in the central Massachusetts highlands. The Tully River valley, east of the school is a bedrock valley that was filled with stratified drift (sand and gravel) during the recession of the glaciers some 18,000 years ago. However, observations and geologic mapping indicates thin overburden deposits of till over bedrock on the hill where the school is located. The bedrock in the area is of the Bronson Hill Zone and mapped in the immediate area of Well #1 as garnetiferous schist of the Littleton 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 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 100 feet and an IWPA protective radius of 401 feet. These protective radii were 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. 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.

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

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	Yes	Yes	Moderate/High	AST in containment in basement/UST at the library in the IWPA.
School	Yes	Yes	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
Residential housing	No	Yes	Moderate	Septic systems, household hazardous materials, home heating fuel.
Septic systems components	No	Yes	Moderate	Residential and the school's wastewater components are in the IWPA.
Transportation and parking	Yes	Yes	Moderate	Monitor stormwater runoff and redirect as necessary to protect the well.

-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 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.

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/Above ground storage tanks;**
3. **School facilities;**
4. **Transportation corridors/parking; and**

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 owns nearly the entire Zone I except for a small portion of North Road. However, the activities in the Zone I are non-conforming since the well is located beneath a bulkhead adjacent to school and the school and all associated activities are within the Zone I. 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 additional 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, fertilizers or hazardous materials near the well.
- ✓ Inspect the well regularly to ensure the cap is secure and there is no standing water near the well.

2. Underground/Above ground fuel oil storage – There is a fuel oil UST in the IWPA and there are ASTs within containment in the IWPA. 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. School facilities – Elementary and preschools generally

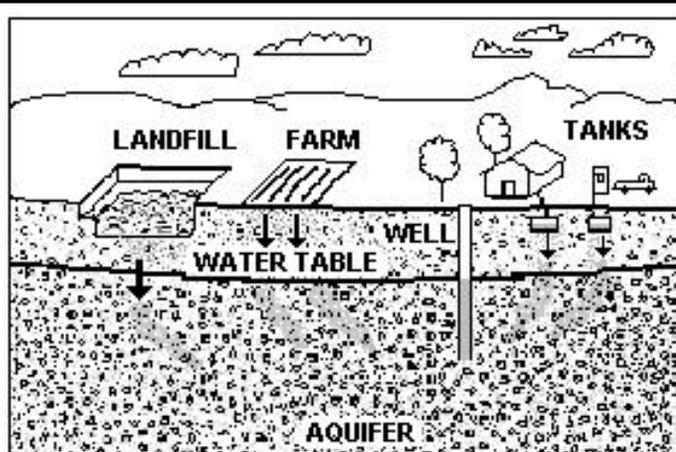


Figure 1: Example of how a well could become contaminated by different land uses and activities.

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 and town boards.

use only household type hazardous materials.

Recommendations:

- ✓ Continue the use of Best Management Practices for all activities at the school.
- ✓ 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.
- ✓ For additional information, refer to the Massachusetts Public Health Associations Healthy Schools website online at http://www.mphaweb.org/pol_schools.html.

4. Transportation corridor/parking – Transportation corridors and 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 the emergency responders to be sure they area aware of the location of your well.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further reduce the well's susceptibility to contamination. The DEP commends the school and the Town on their efforts to remove hazards from the protection area such as redirecting the floor drains and removal of potential hazardous materials from the basement, as well as efforts to acquire funds to remove the UST.

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

Priority Recommendations :

- ✓ Communication with the Town boards and emergency responders regarding the location of the well and the protection areas and continue efforts to remove the UST.

Zone I and IWPA:

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

Training and Education:

- ✓ Staff should be instructed on the proper disposal of spent chemicals. Include custodial staff, teachers, groundskeepers, and the certified operator.

Planning:

- ✓ Request that local officials include the IWPA in the Aquifer Protection District and to continue assisting you in 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.

- 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