Source Water Assessment Program (SWAP) Report for Thornton Burgess Middle 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

Date Prepared
October 16, 2003

Table 1: Public Water System (PWS) Information

PWS Name	**Thornton Burgess Middle School**
PWS Address	**Wilbraham Road**
City/Town	**Hampden, Massachusetts**
PWS ID Number	**1120006**
Local Contact	**Mr. Michael Framarin**
Phone Number	**413-525-4879**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	1120006-01G	159	455	Moderate
Well #2	1120006-02G	155	452	Moderate

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 Thornton Burgess Middle School (the school) is located in the west-central side of Hampden. The school student and staff population is approximately 350 people per day and the school is served by two potable supply wells (Well #1 and Well #2). Well #1 is located southwest of the school near the tennis court and Well #2 is located near Wilbraham Road northeast of the school. There is no municipal wastewater sewer system in Hampden; therefore, the school and surrounding facilities are served by on-site 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 wells both have 6-inch diameter casings however little is known about the wells. Well #2 was installed prior to construction of the school and Well #1 was installed during school construction. Well #1 is a bedrock well and is approximately 380 feet deep; Well #2 is approximately 94 feet deep. Geologic mapping in the area indicates overburden deposits of 85 feet of sand with 14 feet of till over bedrock at the school. It is unclear if Well #2 is in the overburden or in 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 some 14,000 to 18,000 years ago. The school is located immediately in the vicinity of the eastern valley border fault that separates the Jurassic sedimentary beds of the Connecticut River valley from the metamorphic (schist) rocks of the eastern highlands. There is some stratified drift along the flank of the hills to the east but only thin till covering on the uplands with numerous bedrock outcrops mapped.

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 then the IWPA. The wells have Zone I protective radii of 159 and 155 feet, respectively and (IWPA) radii of 455 and 452 feet, respectively. These protective radii were calculated based on the metered water use from the two highest months of use. The wells are used alternately to meet school demand. Please refer to the attached map that shows the Zone I and IWPA. The Zone I areas for the wells are not conforming to current DEP requirements. The Zone I area for 01G includes the school boiler room and fuel oil, a residential lot with a home, recreational facilities and components of septic systems; the Zone I for 02G includes Wilbraham Road. The IWPAs include additional residential development and part of a golf course.

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

Potential Sources of Contaminants	Zone I	IWPA	Threat	Comments
Fuel Oil Storage	Well #1	Both	Moderate	AST w/contain ment at school
Floor Drains in Boiler Rooms	Well #1	Both	Moderate	Consult with UIC program regarding compliance
Athletic fields	No	Well # 1	Moderate	Continue current practice of prohibiting the use of pesticides/fertilizers on fields
School facilities and parking	Well #1	Both	Moderate	Limit road deicing usage, use BMPs for household hazardous materials and monitor parking areas and control stormwater
High to medium density residential housing	Well #1	Both	Moderate	Septic systems, household hazardous materials, home heating fuel
Transportation Corridor	Well #2	Both	Moderate	Wilbraham Road
Septic systems components	Both	Both	Moderate	School leachfield in the IWPA, force main in Zone I – Well #1
Golf Course	No	Both	Moderate	Pesticides and hazardous materials from equipment used on course. Golf course has an Integrated Pest Management plan.

-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.

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 Is and IWPAs 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. **Non-conforming Zone I;**
2. **Floor drains in boiler rooms;**
3. **School facilities and athletic fields:**
4. **Residential housing; and**
5. **Golf course.**

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 moderate threat activities 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 either well. 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 #2 extends across a public road and includes the school and part of one home.

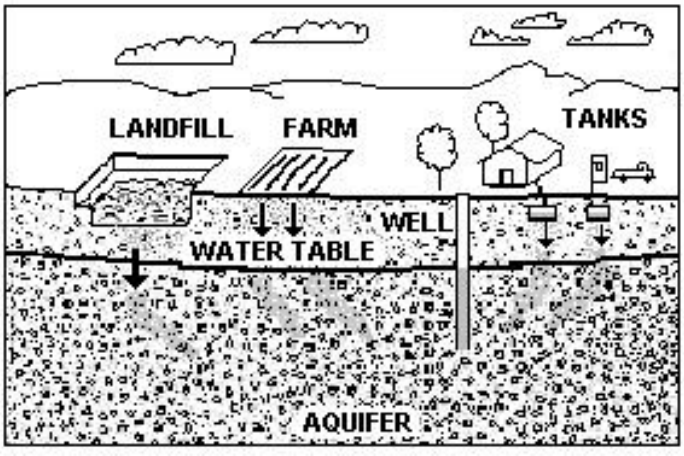

Figure 1: Example of how a well could become contaminated by different land uses and activities.

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 handling treatment chemicals and vehicles used to access the area.
- Monitor all fuel oil deliveries.
- Do not use or store pesticides, fertilizers or road salt within the Zone I.

2. Aboveground fuel oil storage tank – A fuel oil AST is located within the Zone I of Well #1. It is in the building and within containment. The school has a backup generator that is fueled by propane. If managed improperly, fuel oil tanks and the fuel lines 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

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.

fire department for any additional local code requirements regarding ASTs.

- Monitor all activities associated with the fuel oil, especially delivery.
- 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.

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 that 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 all cracks in the floor and the floor drain if it cannot be adequately protected to prevent a prohibited discharge.

3. School facilities and athletic fields - Middle schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some if 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 or pesticides. 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, as required.
- 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. 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 are several residences within the IWPA protection areas and one partially within the Zone I of Well #2. 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

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** – Catchbasins 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. Golf Course – The Hampden Country Club is located adjacent to the school. The club is a PWS and has a water withdrawal permit under the Water Management Act. The club has submitted a plan for Integrated Pest Management and the Department of Agricultural Resources regulates the use of pesticides.

V Encourage golf course managers to utilize the Integrated Pest Management (IPM) approach. 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.

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 current protection practice 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 wells. As an example, the subdivision built partially within the Zone I of Well #2 may have been modified to be more protective.

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

Priority Recommendations:

V Communication with the Town boards regarding the location of the wells and the protection areas.

V Contact the UIC coordinator to evaluate compliance for the floor drains in the boiler room.

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 Monitor activities and if there is evidence of increased activity or access, consider relocating the wells.

V Post drinking water supply signs in key location such as along the access road and in the parking areas but away from the wells themselves.

V Provide information to staff and pertinent school organizations about the potential hazards of household chemicals, lawn care chemicals and fertilizers.

V Use Best Management Practices (BMPs) for the use of petroleum products, lawn care products, pesticides and household hazardous waste.

Training and Education:

V Incorporate groundwater education into the school curriculum (K-6 curricula available; contact DEP for copies).

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

Facilities Management:

V Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, and 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 wells' 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 area 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