Source Water Assessment Program (SWAP) Report for Leverett 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

Date Prepared:
October 16, 2001

Table 1: Public Water System (PWS) Information

PWS Name	**Leverett Elementary School**
PWS Address	**Montague Road**
City/Town	**Leverett, Massachusetts**
PWS ID Number	**1154001**
Local Contact	**Mr. John Kuczek**
Phone Number	**413-548-9144**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	1154001-01G	128	434	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 Leverett Elementary School is a rural, elementary school located on the east side of Montague Road in Leverett. The school student and staff population is approximately 230 people per day and is served by a single potable supply well (Well #1) located west of the school. The school well also supplies potable water for the adjacent Town facilities (Highway and Fire Department Buildings) and is intended to supply the proposed library facility. The school and municipal facilities are undergoing renovation and/or new construction. The school attempted to replace the existing well with a new source located in a more remote location. However, the water from the new well is turbid and has high concentrations of dissolved solids. The estimated cost of treatment may be cost prohibitive and the community is working with the DEP to consider various options for a new supply.

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).

The current well has a Zone I protective radius of 128 feet and an Interim Wellhead Protection Area (IWPA) radius of 434 feet based on an average, maximum daily withdrawal rate from metered usage data. The protective radii were based on the average daily-metered water use for the two highest months on record. Please refer to the attached map that shows the Zone I and IWPA. The Zone I is the area immediately around the wellhead while the IWPA is a larger area that likely contributes water to the wellhead. The IWPA is only an interim protection area; the actual area of contribution to the wellhead may be larger or smaller.

The 6-inch diameter well is, estimated to be drilled to a depth of approximately 200 feet below ground and utilizes the bedrock aquifer. There is no record of the well construction or the materials encountered during drilling of the well. The geologic mapping of the area indicates stratified drift, sand and gravel deposits in the vicinity of the school although there is no description of the depth of the deposits. The area is located within the Town of Leverett's Aquifer Protection District. The bedrock geological map shows complex bedrock structure in the vicinity of the school and describes various bedrock formations of sulfidic schist, amphibolite and gneiss. Wells drilled in these conditions are considered highly vulnerable to potential contamination from the ground surface because there is no significant hydrogeologic barrier, such as clay, to prevent surface contamination from migrating into the bedrock aquifer. The water from the school's current well 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.

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. **Structures in the Zone I**
2. **Septic System**
3. **Floor drain in boiler room**
4. **Parking and roadway**

There are activities within Zone I that are not related to water supply and the well is

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

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Septic System components	No	Yes	Moderate	Refer to the attached septic system fact sheet.
Floor Drain in the boiler room to septic system	Yes	Yes	Moderate	Floor drain must be protected from accidental spills or connected to tight tank.
Parking area and roadway	Yes	Yes	Moderate	Storm water drains away from the wellhead
Aboveground oil tank	No	Yes	Moderate	Covered and in containment
School structure and Fire Station	Yes	Yes	-	Non-conformance with Zone I requirements

- **-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.

located in an aquifer with a high vulnerability to contamination due to the absence of a significant hydrogeologic barrier to prevent contaminant migration from the surface. The overall ranking of susceptibility to contamination for the well is moderate, based on the presence of at several moderate threat land uses or activities in the Zone I and IWPA, as seen in Table 2.

1. Nonconforming activities in Zone I – Currently, the well does not meet DEP's restrictions, which only allow water supply related activities in Zone I. The facility's Zone I contains school buildings, roads and parking areas. The public water supplier does not own and/or control all land encompassed by the Zone 1. Please note that systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying systems.

Recommendations:

- ✓ Maintain contact with the DEP regarding alternatives to the existing source.
- ✓ Monitor activities within the Zone I and minimize as much as is feasible, activities in Zone I.

2. Septic system components in the IWPA - The septic tank, grease trap, pipeline, distribution box and leachfield are all within the IWPA of the well. If a septic system fails or is not properly maintained it could be a potential source of microbial contamination. Improper disposal of household hazardous chemicals or petroleum products to septic systems or discharge from the boiler room are also potential sources of contamination to the leachfield. The Highway Department is scheduled to have a tight tank installed for the garage.

Recommendations:

- ✓ Staff should be instructed on the proper disposal of spent household chemicals. Include custodial staff, groundskeepers, certified operator, Town Highway and Fire Department personnel. The Town Highway Department is registered as a generator of hazardous waste or waste oil. Continue to diligently monitor use, storage and disposal of hazardous materials.
- ✓ Septic system components should be inspected and maintained on a regular basis.

3. Floor drain in the boiler room – Floor drains may be required in boiler rooms to provide drainage in the event of a plumbing failure. If there is a potential for oil or hazardous materials to flow accidentally into the floor drain, however, the floor drain must be sealed or connected to a tight tank if no sewer is available. The boiler room at the Leverett Elementary School has a floor drain that discharges to the septic system. The boiler is set within a recessed containment structure. At the time of the site visit, there were cracks and holes in the floor of the containment area that could act as conduits to the ground in the event of a release of oil and the old oil lines from the abandoned tank were not drained or capped. Immediately following the visit, the abandoned oil lines were drained and filled. The oil line was bermed so that it would drain to the recessed, cemented containment area that holds the boiler in the event of a line break. All breaks in the floor were cemented and sealed to contain any potential spills.

Recommendations:

- ✓ Continue current investigation regarding the feasibility of sleeving the oil line from the tank to the boiler.
- ✓ Prepare a written policy and plan for maintenance operations, especially when oil filters are changed. Require your boiler maintenance contractor to use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while

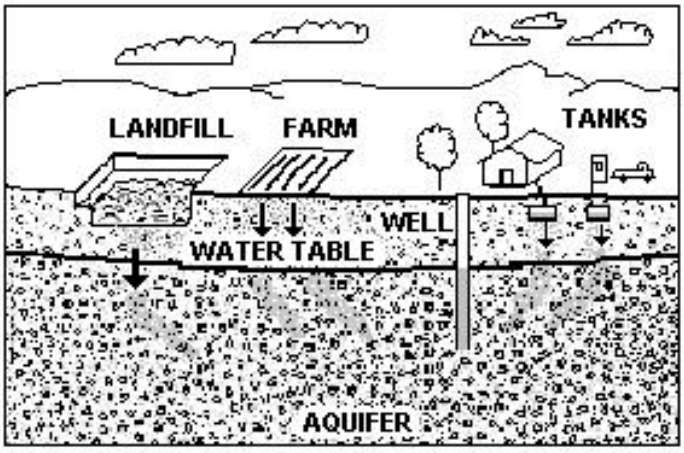

Figure 1: Example of how a well could become contaminated by different land uses and activities.

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.

conducting routine maintenance. Please note that boiler blow down generated during routine maintenance cannot be discharged through the floor drain and must be disposed of off site.
- ✓ If protection of the floor drain cannot be assured, seal the floor drain or a tight tank must be installed for the floor drain.

4. Parking and roadway - The bus drop-off area, Montague Road and parking areas are within the Zone I and IWPA of the well. Drainage from the school is discharged to an area that topographically drains away from the wellhead.

Recommendations:
- ✓ Use minimal road salt and deicers.
- ✓ Monitor the parking lot for spills and leaks.
- ✓ Maintain a buffer from parking near the well.

Other land uses observed were portions of the Town complex (Fire Station and Highway Department Garage), pad mounted electrical transformers, residential homes and septic systems all located within or just outside of the IWPA of the well. Store all petroleum products in secondary containment and contact the power utility to ensure that the oil in the transformer does not contain PCBs. Inform residential neighbors of BMPs for septic system management, lawn care and management of household hazardous materials.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Leverett Elementary School is commended for recent actions and current protection measures.

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

Zone I and IWPA:
- ✓ Keep any new non-water supply activities out of the Zone I.
- ✓ Conduct regular inspections of the Zone I and monitor the area for spills and leaks.
- ✓ Monitor oil delivery and storage.
- ✓ Continue working with DEP to regarding the potential for replacement of the well.
- ✓ Post drinking water supply signs key location such along the access road and in the parking area.
- ✓ Provide information to staff about the potential hazards of household chemicals, lawn care chemicals and fertilizers.
- ✓ Do not use fertilizer or pesticides.
- ✓ Use Best Management Practices (BMPs) for hazardous products.

Training and Education:
- ✓ Incorporate groundwater education into school curriculum (K-6 curricula available; contact DEP for copies).

Facilities Management:
- ✓ Septic system components should be maintained on a regular basis. Refer to the appendices for more information regarding septic systems.
- ✓ Continue staff training in the handling of hazardous materials.

Planning:
- ✓ 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 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". For additional information, please refer to the attached program fact sheet. Please note that each program year, on or about May 1 the Department posts a new Request for Response (RFR), grant application form. Generally, the applications are due on or about June 30. 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 spur 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 Closure documents
- Your Septic System Brochure
- Grant Program Fact Sheet