Source Water Assessment Program (SWAP) Report
For
Brimfield Housing Authority

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

Date Prepared:
January 5, 2001

Table 1: Public Water System (PWS) Information

PWS Name	**Brimfield Housing Authority**
PWS Address	**Colonial Park, US Route 20**
City/Town	**Brimfield, Massachusetts**
PWS ID Number	**1043002**
Local Contact	**Director, Virginia T. Butler**
Phone Number	**413-245-7056**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well #1	01G	240	590	HIGH

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.

Maintaining Your Good 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.

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. Massachusetts Department of Environmental Protection (MA 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. Attached Map of the Protection Areas
5. Attachments

1. DESCRIPTION OF THE WATER SYSTEM

Well # 1
The Brimfield Housing Authority (Housing Authority) is an elderly housing complex located off of Route 20 in the center of town, behind the Town Hall and is classified as a Community water supply. The facility contains three separate apartment buildings, an office building, a maintenance garage with a cement floor and a community center. The single water supply well (Well #1) for the Housing Authority is within an underground vault located in the lawn east of the main building, approximately twenty-five feet south of the paved parking area. The water withdrawal is not metered at the Housing Authority and a pumping test has not been conducted to determine the safe yield of the aquifer and well. Therefore, the water usage was estimated to be approximately 8,550 gallons per

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).

day, utilizing Title 5 septic system design flow criteria of 150 gallons per day, per unit. Based on that estimated water usage, the Zone I radius for Well #1 is 240 feet and the radius for the Interim Wellhead Protection Area (IWPA) is 590 feet.

Well #1 has a 6-inch diameter steel well casing set into the bedrock and an open rock boring to the bottom of the well, approximately 467 feet deep. No further details about the well construction are known. The well, the storage tank, the motor controls and the distribution pumps are all located within a locked, underground vault with a cement floor. Although it is unknown if a grout sanitary seal was emplaced around the well during construction, the cement floor of the vault is intact and provides some protection from potential contaminants traveling along the casing.

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 Housing Authority. 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 20 feet) material overlying the bedrock aquifer utilized by the Housing Authority, 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. Bedrock wells drilled in these conditions are assigned a high vulnerability to contamination due to the absence of a hydrogeologic barrier.

The Water Quality

The water quality from the Brimfield Housing Authority water supply Well #1, currently does not require treatment and meets all US Environmental Protection Agency (EPA) and MA DEP drinking water quality standards. On three occasions, in 1997 and 1998, very low concentrations of Volatile Organic Compounds (VOCs) were reported in a sample from the Housing Authority's water supply. Two neighboring properties, the elementary school and the fire station have also reported very low concentrations of VOCs in their water supplies. In all cases, the reported concentrations were well below the Maximum Contaminant Levels as established by the EPA and the MA DEP. The source(s) of these compounds has not been identified.

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

Facility Type	Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Housing Authority	Below Grade Transformers	Yes	Yes	Moderate	Oil/Potentially PCBs – Contact utility to determine
	Storage, use, and handling of hazardous materials	Yes	Yes	High	Maintenance equipment, petroleum products, generator and fertilizer
	Parking lot, driveways & roads	Yes	Yes	Moderate	Continue use of salt alternatives
	Storm drains	Yes	Yes	Low	Roof drain in Zone I; stormwater drains in IWPA
	Septic system: lines, tank and field	Yes	Yes	Moderate	The tank is in Zone I; the leachfield is in the IWPA. See septic systems brochure
USTs	Petroleum products (USTs), Two Tier IC confirmed gasoline release sites	No	No	High	Known gasoline/heating oil storage. Two release sites. No confirmed impact on the Housing Authority well water quality

*** -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.

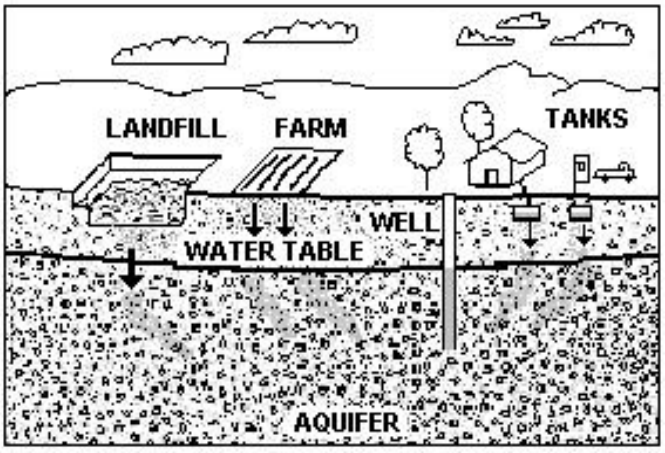

Figure 1: Example of how a well could become contaminated by different land uses and activities.

However, there are two confirmed hazardous materials release sites (two gasoline stations on Route 20) in the vicinity of the Housing Authority that are being cleanup and/or monitored. Table 2 also identifies other activities near the Housing Authority's well. Due to these factors, the Housing Authority is required to continue monitoring for VOCs annually. No VOCs were reported in the samples collected in 1999 and 2000. For current monitoring results, please refer to the Housing Authority's most recent Consumer Confidence Report (CCR) or call Virginia Butler, the Public Water System contact person listed above.

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

There are a number of land uses and activities within the drinking water supply protection areas and within close proximity to the Housing Authority that are potential sources of contamination. Please refer to Table 2.

Key issues include:

1. Non-water related activities within Zone I;
2. Below Grade Transformers;
3. Storage, use, and handling of hazardous materials;
4. Parking lot, driveways & roads;
5. Septic System;
6. Storm drains;
7. Underground Storage Tanks (USTs) for petroleum products at two gasoline stations (confirmed, hazardous materials release sites), school and fire station/DPW garage.

One high and three moderate threat activities are located within the Zone I and IWPA. In addition, two confirmed release sites and two other UST facilities are located within proximity of the Housing Authority. Based on these activities and the historical water quality issues, the overall ranking of susceptibility to contamination for the Housing Authority well is high.

1. Activities within Zone I - Currently, the well does not meet DEP's land use restriction that allows only water supply related activities and buildings in the Zone I. The Zone I for Well #1 contains almost all activities related to the facility including apartment buildings, parking areas and maintenance storage garage. Please note, systems that do not meet DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any other new activities within the Zone I.

2. Below Grade Transformers – All electrical transformers contain oil and depending on the age of the transformer, the oil may contain PCBs. The three transformers at the Housing Authority are recessed below grade in open bottom pits. If one of the transformers were to rupture, the oil would be released to the soils and could potentially impact water quality in the well. Upon request, the electrical utilities change the oil in transformers that contain PCBs and may convert the below grade transformers to above grade systems.

3. Storage, use, and handling of hazardous materials – The maintenance garage is located within the Zone I of the well. The garage was tidy with no evidence of significant amounts of materials storage or spills. Although the garage has a cement floor and there are no floor drains, the materials kept within the

For More Information:

Contact Catherine V. 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 DEP's 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:

- Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
- MA DEP SWAP Strategy
- Land Use Pollution Potential Matrix
- Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water department, town boards, the town library and the local media.

garage (gasoline power generator, lawn mower, small amounts of petroleum products and fertilizer) pose a potential treat to the well due to proximity and the potential for accidental release. It is recommended that an alternative storage facility, away from the Zone I be considered. Until an alternative storage site is available, secondary containment and proper management of these materials is important.

4. Parking area, driveway and roads - The parking area is within 25 feet of the well vault and the drive and roadways are within 31 feet of the vault. All of the areas are paved with storm drains that discharge to a single outfall located approximately 180 feet south of the well

5. Septic System – Some components of the Housing Authority's septic system, such as sewer lines and tank are within the Zone I. The leachfield is in the IWPA approximately 250 feet from the well. The Housing Authority maintains the septic system through regular pumping and the tenants are informed regarding proper disposal practices. There is no sewer in Brimfield.

6. Storm drain - .One drywell for roof runoff is located approximately 110 feet south of the well. As previously noted in item 4, parking lot storm drains discharge within the Zone I to a single outfall located approximately 180 feet south, topographically down gradient, of the well

7. USTs - Although none of the USTs are within the IWPA, there are currently four known UST locations within close proximity to the Housing Authority. Two gasoline stations along Route 20, on the corner of Route 19 are confirmed (Tier 1C) gasoline release sites. Both site owners are cleaning up the sites and monitoring private wells and the groundwater quality in the vicinity of their facilities. The Brimfield Elementary School has a relatively new 10,000-gallon UST east of the building just south of the Housing Authority. The Brimfield Fire Station has a new gasoline UST just south of the station and the school. Both the school and fire station USTs have monitoring systems to detect leaks.

3. PROTECTION RECOMMENDATIONS

The Brimfield Housing Authority along with its certified operator should review and adopt the following recommendations, some of which may require contact with and cooperation of the Brimfield Town government: Implementing these recommendations will reduce the system's susceptibility to contamination.

Zone I and IWPA:

- Remove all potentially hazardous materials (gasoline, petroleum products and fertilizers) from the Zone I. The Housing Authority is eligible and should consider applying for a Wellhead Protection Grant to construct a storage shed outside of the Zone I. Until that time, use containment and caution when using and storing these products.
- Keep all new non-water supply activities out of the Zone I.
- Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use or modifying their system.
- Conduct regular inspections of the Zone I and IWPA. Look for illegal dumping, evidence of vandalism and other activities on and off of your property that may pose a potential threat to your water supply.
- Consider upgrading the current gasoline powered backup generator to a propane or natural gas back-up power source in the future. This is also an eligible grant project.

Training and Education:

- Continue educating tenants with respect to using cleaning compounds that are safe for the septic system and regarding proper disposal practices, i.e. only sanitary waste in the septic system.

- Post drinking water protection area signs at key visibility locations.

Facilities Management:

- Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/brp/dws/dwspubs.html.
- Upgrade all existing oil/hazardous material storage areas to incorporate secondary containment and safety practices.
- Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on Housing Authority property. Minimize or eliminate fertilizers within Zone I. See Pesticide Fact Sheet.
- Continue the good practice of inspecting and maintaining septic system components on a regular basis. Refer to the appendices for more information regarding septic systems.
- Contact the utility again regarding the below grade transformers. One request has already been made to the utility. Request that the utility make a determination if PCBs are present in the transformers and inquire about upgrading the transformers to above grade units with cement pads. Keep the area near the transformer free of tree limbs that could endanger the transformer in a storm.

Planning:

- Work with local officials in Brimfield to include the Housing Authority IWPA in an Aquifer Protection District with protective bylaws to assist you and other PWSs in improving protection. The DEP can assist the community in developing bylaws.
- Prepare a Wellhead Protection Plan and Emergency Response/Contingency Plan to address short-term water shortages/emergencies and long-term water demands. As an example, 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.

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.

Attachment:
Map of the Public Water Supply (PWS) Protection Area.
Pesticide Fact Sheet
Septic System Fact Sheet
Sample SWAP language for your CCR

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