Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for

East Northfield Water Company

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.

Susceptibility and Water Quality

Susceptibility is a measure of a water supply's potential to become contaminated due to land uses and activities within its recharge area.

A source's susceptibility to contamination does *not* imply poor water quality.

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

Actual water quality is best reflected by the results of regular water tests. To learn more about your water quality, refer to your water supplier's annual Consumer Confidence Reports.

Table 1: Public Water System Information

PWS Name	East Northfield Water Company
PWS Address	Northfield Mount Hermon School 206 Main Street
City/Town	Northfield
PWS ID Number	1217001
Local Contact	George Santucci
Phone Number	413-498-3455

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 storm runoff, 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 sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures.

Refer to Table 3 for Recommendations to address potential sources of contamination. 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 the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection
4. Appendices

What is a Watershed?

A watershed is the land area that catches and drains rainwater down-slope into a river, lake or reservoir. As water travels down from the watershed area it may carry contaminants from the watershed to the drinking water supply source. For protection purposes, watersheds are divided into protection Zones A, B and C.

Section 1: Description of the Water System

Source Name	*Source ID*	*Susceptibility*
Grandin Reservoir	1217001-01S	Moderate

The East Northfield Water Company maintains and operates the Grandin Reservoir, serving a portion of the Northfield Mount Hermon School and several private residences in the vicinity of the school. Northfield is a small, predominantly rural, residential community in western Massachusetts along the Vermont border. The Grandin Reservoir is approximately 7.1 acres in size (surface area) with an estimated safe yield of approximately 0.2 million gallons per day (MGD). The reservoir and approximately 95% of the watershed is owned by the Northfield Mount Hermon School, which leases the property to the East Northfield Water Company. The entire property is designated in the Northfield Mount Hermon operating plan as water supply protection area. The East Northfield Water Company has prepared and is implementing a watershed protection plan to manage the watershed. Water from the reservoir is chlorinated for disinfection prior to distribution. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report.

The watershed is located in a forested upland area of moderate to steep terrain with shallow bedrock primarily covered by thin till. The USGS mapped the bedrock geology of the Grandin Reservoir and its watershed area as an area of amphibolite lens within in the Monson gneiss, a light-gray, medium-grained gneiss, with quartz, and biotite.

Section 2: Land Uses in the Protection Areas

The watershed for the Grandin Reservoir is 98% forested land. Over 95% of the land is owned by Northfield Mount Hermon School, which holds a 99-year lease with the East Northfield Water Company. Surface water supplies by their nature are highly vulnerable to potential contamination. The East Northfield Water Company Reservoir has a MA DEP approved watershed protection plan, prohibits vehicular traffic to the watershed, actively conducts drinking water supply education, watershed management, and regularly inspects the watershed to maintain a waiver from filtration. There are few anthropomorphic threats within the watershed. Land uses and activities that are potential sources of contamination are listed in Table 2.

Key Land Uses and Protection Issues include

1. Access road
2. Potential for presence of aquatic mammals
3. Forest operations

The overall ranking of susceptibility to contamination for the system is moderate. Although the potential sources of contamination are ranked low, the vulnerability of the surface water supply increases its potential susceptibility. Please refer to Table 2 for the summary of potential sources of contamination.

1. Access Road -- The gravel access road through the watershed crosses one tributary stream and follows along the major tributary to the reservoir. At the time of the assessment, active logging was being conducted and erosion along the road was evident although actively being managed. During and following the completion of the logging activities the road was graded to prevent direct

Glossary
Protection Zones

Zone A: is the most critical for protection efforts. It is the area 400 feet from the edge of the reservoir and 200 feet from the edge of the tributaries (rivers and/or streams) draining into it.

Zone B: is the area one-half mile from the edge of the reservoir but does not go beyond the outer edge of the watershed.

Zone C: is the remaining area in the watershed not designated as Zones A or B.

The attached map shows Zone A and your watershed boundary.

runoff to the reservoir. In addition, the bridge across the tributary was significantly deteriorated and was reinforced to allow access with the logging equipment.

Access Road Recommendations:

- ✓ Continue to inspect and maintain the road to manage erosion and runoff; re-grade the road as necessary.
- ✓ Continue pursuing alternatives to repair or replace the bridge to maintain access and prevent the bridge from collapsing into the tributary.

2. Potential for Impact from Wildlife and Aquatic Mammals – As a surface water supply, there is potential for aquatic mammals (beavers and muskrats) to live in and near the surface water supplies. Aquatic mammals pose a potential threat of microbial contamination of the source from *Giardia Lamblia* and *Cryptosporidium*, pathogens that are identified in the Surface Water Treatment Rule and Enhanced Surface Water Treatment Rule as posing an unacceptable risk to drinking water. There is no evidence of current aquatic mammal populations in the watershed. The steep topography of the watershed may provide limited habitat for aquatic mammals.

Wildlife Recommendations:

- ✓ Continue to monitor the watershed and reservoirs for the presence of aquatic mammals and their proximity to the intake.
- ✓ Monitor raw water quality and assess potential impacts.

3. Forest Operations – Approximately 98% of the watershed consists of densely forested areas. Much of the watershed, including portions of Zone A, were part of a recently completed cutting plan. Every 10-30 years, a forest harvest project is performed in the watershed. No new cutting is scheduled at this time. Forestry operations can allow for runoff-induced erosion of soils, which can create a problem with turbidity and increased particulates in the water. There was no evidence of water quality impacts from the logging operations noted during the assessment.

Forest Operation Recommendations:

- ✓ Continue current strict adherence to a forest management and cutting plans.
- ✓ Maintain current diligence and effort to prevent runoff of roads and cut areas.
- ✓ Update watershed management plan and forest management plans as appropriate and necessary.

Additional land uses identified in the watershed are high voltage lines located in the southeast corner of the Zone C, operated by Western Massachusetts Electric. Contact the utility and supply them with a current map of the watershed to ensure the accuracy of the information the utility utilizes to prepare their management plan for the Right-of way within the water supply watershed.

Identifying potential sources of contamination is an important initial step in protecting your drinking water sources. Further local investigation will provide more in-depth information and may identify new

Benefits of Source Protection

Source Protection helps protect public health and is also good for fiscal fitness:

- Protects drinking water quality at the source
- Reduces monitoring costs through the DEP Waiver Program
- Treatment can be reduced or avoided entirely, saving treatment costs
- Prevents costly contamination clean-up
- Preventing contamination saves costs on water purchases, and expensive new source development

Contact your regional DEP office for more information on Source Protection and the Waiver Program.

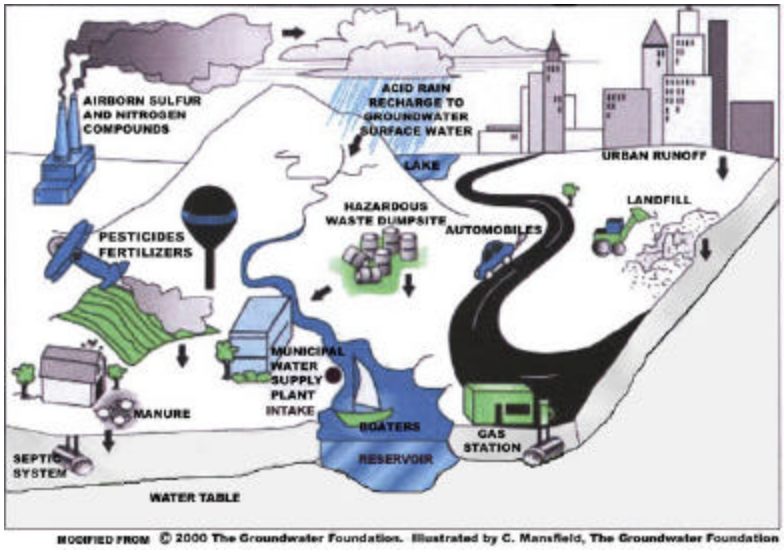

Figure 1: Sample watershed with examples of potential sources of contamination

land uses and activities that are potential sources of contamination. Once potential sources of contamination are identified, specific recommendations like those below should be used to better protect your water supply.

Section 3: Source Water Protection Conclusions and Recommendations

Current Land Uses and Source Protection:
As with many water supply protection areas, the protection areas contain potential sources of contamination. However, source protection measures reduce the risk of actual contamination, as illustrated in Figure 2. The East Northfield Water Company watershed contains few threats due to forethought in development of the source and purchase of nearly the entire watershed. The supplier is commended for their continued proactive water supply protection through:

- Preparing and actively pursuing a drinking water supply, watershed management plan,
- Actively controlling access and,
- Endorsing public education about the water supply.

Additional Source Protection Recommendations:
To maintain protection of the source for the future:

- ✓ Continue regular watershed inspections.
- ✓ Continue to assist in educating residents on ways they can help you to protect drinking water sources.
- ✓ Work with emergency response teams to ensure that they are aware of the watershed boundaries and to cooperate on responding to spills or accidents.
- ✓ In addition to the designation of the watershed in the school operational plan, consider obtaining a conservation restriction on the watershed parcels' deed to ensure protect the source beyond the 99-year lease.
- ✓ Maintain communication with Western Massachusetts Electric to protect your watershed. Provide them with current maps to keep them informed of the Right-of-Way areas within the Zone C.

What are "BMPs?"

Best Management Practices (BMPs) are measures that are used to protect and improve surface water and groundwater quality. BMPs can be structural, such as oil & grease trap catch basins, nonstructural, such as hazardous waste collection days or managerial, such as employee training on proper disposal procedures.

Conclusions:
These recommendations are only part of your ongoing local drinking water source protection. Additional source protection recommendations are listed in Table 3, the Key Issues above and Appendix A.

DEP staff, informational documents, and resources are available to help you build on this SWAP report as you continue to improve drinking water protection in your community. The Department's Source Protection Grant Program provide funds to assist public water suppliers in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the Grant Program. Please note: each spring DEP posts a new Request for Response for the grant program (RFR).

Other grants and loans are available through the

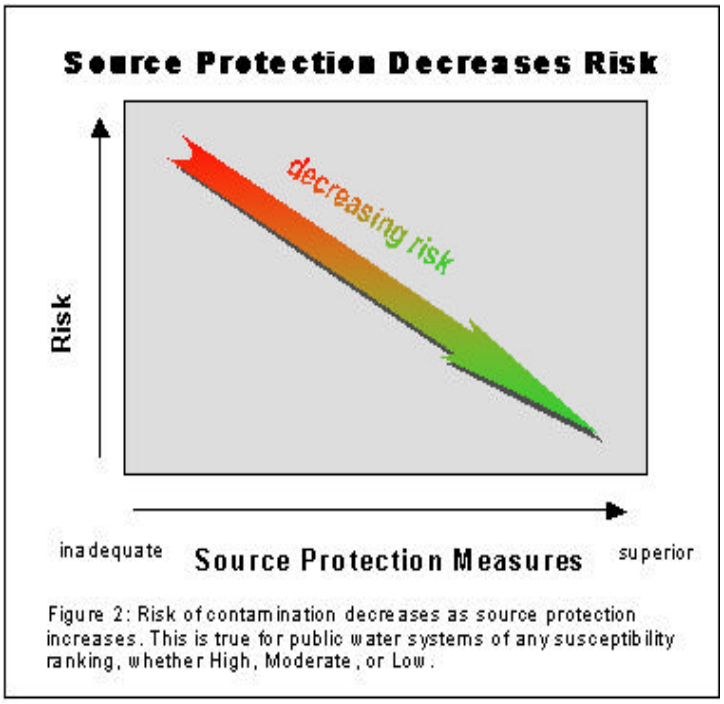

Figure 2: Risk of contamination decreases as source protection increases. This is true for public water systems of any susceptibility ranking, whether High, Moderate, or Low.

Potential Source of Contamination vs. Actual Contamination

The activities listed in Table 2 are those that typically use, produce, or store contaminants of concern, which, if managed improperly, are potential sources of contamination (PSC).

It is important to understand that a release may never occur from the potential source of contamination provided facilities are using best management practices (BMPs). If BMPs are in place, the actual risk may be lower than the threat ranking identified in Table 2. Many potential sources of contamination are regulated at the federal, state and/or local levels, to further reduce the risk.

Table 2: Land Use in the Watershed

For more information, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area

Land Uses	Quantity	Threat	Potential Contaminant Sources*
Agricultural			
Forestry Operation	54 acres	L	Equipment maintenance materials: leaks, spills, or improper handling; road building, erosion (Approximately 10-year cutting cycle recently completed)
Miscellaneous			
Aquatic Wildlife	Potential	L	Microbial contaminants
Transmission Line Rights-of-Way Type: Electric (High Voltage Lines)	1.3 acres	L	Corridor maintenance pesticides: over-application or improper handling; construction. Request manual cutting only.

Notes:

1. When specific potential contaminants are not known, typical potential contaminants or activities for that type of land use are listed. Facilities within the watershed may not contain all of these potential contaminant sources, may contain other potential contaminant sources, or may use Best Management Practices to prevent contaminants from reaching drinking water supplies.
2. For more information on regulated facilities, refer to Appendix B: Regulated Facilities within the Water Supply Protection Area information about these potential sources of contamination.
3. For information about Oil or Hazardous Materials Sites in your protection areas, refer to Appendix C: Tier Classified Oil and/or Hazardous Material Sites.

*** THREAT RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other PSCs. The ranking of a particular PSC is based on a number of factors, including: the type and quantity of chemicals typically used or generated by the PSC; the characteristics of the contaminants (such as toxicity, environmental fate and transport); and the behavior and mobility of the pollutants in soils and groundwater.

Drinking Water State Revolving Loan Fund, the Clean Water State Revolving Fund, and other sources. For more information on grants and loans, visit the Bureau of Resource Protection's Municipal Services web site at: http://mass.gov/dep/brp/mf/mfpubs.htm.

The assessment and protection recommendations in this SWAP report are provided as a tool to encourage community discussion, support ongoing source protection efforts, and help set local drinking water protection priorities. Citizens and community officials should use this SWAP report to spur discussion of local drinking water protection measures. The water supplier should supplement this SWAP report with local information on potential sources of contamination and land uses. Local information should be maintained and updated periodically to reflect land use changes in the watershed. Use this information to set priorities, target inspections, focus education efforts, and to develop a long-term drinking water source protection plan.

Section 4: Appendices

A. Protection Recommendations
B. Additional Documents on Source Protection

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

Top 5 Reasons to Develop a Local Surface Water Protection Plan

❶ Reduces Risk to Human Health

❷ Cost Effective! Reduces or Eliminates Costs Associated With:

- Increased monitoring and treatment
- Water supply clean up and remediation
- Replacing a water supply
- Purchasing water

❸ Supports municipal bylaws, making them less likely to be challenged

❹ Ensures clean drinking water supplies for future generations

❺ Enhances real estate values – clean drinking water is a local amenity. A community known for its great drinking water in a place people want to live and businesses want to locate.

Table 3: Current Protection and Recommendations

Protection Measures	Status	Recommendations
Zone A		
Does the Public Water Supplier (PWS) own or control the entire Zone A?	**YES**	Follow Best Management Practices (BMP's) that focus on good housekeeping, spill prevention, and operational practices to reduce the use and release of hazardous materials.
Is the Zone A posted with "Public Drinking Water Supply" Signs?	**YES**	Additional economical signs are available from the Northeast Rural Water Association (802) 660-4988.
Is the Zone A regularly inspected?	**YES**	Continue daily inspections of drinking water protection areas.
Are water supply-related activities the only activities within the Zone A?	**YES**	Continue monitoring activities in Zone A.
Municipal Controls (Zoning Bylaws, Health Regulations, and General Bylaws)		
Does the municipality have Surface Water Protection Controls that meet 310 CMR 22.20C?	**N/A**	East Northfield Water Company has controls through ownership
Do neighboring communities protect the water supply protection areas extending into their communities?	**N/A**	East Northfield Water Company has controls through ownership
Planning		
Does the PWS have a local surface water supply protection plan?	**YES**	Maintain and follow the surface water supply protection plan.
Does the PWS have a formal "Emergency Response Plan" to deal with spills or other emergencies?	**YES**	Augment plan by developing a joint emergency response plan with fire department, Board of Health, DPW, and local and state emergency officials. Coordinate emergency response drills with local teams.
Does the municipality have a watershed protection committee?	**N/A**	
Does the Board of Health conduct inspections of commercial and industrial activities?	**N/A**	
Does the PWS provide watershed protection education?	**YES**	Continue educational efforts through the school.