Massachusetts Department of Environmental Protection

Source Water Assessment and Protection (SWAP) Report

Clinton Water Department

What is SWAP?

The Source Water Assessment and Protection (SWAP) Program, 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 of a drinking water source does not imply poor 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.

Risk refers to the potential for a consumer to drink water of compromised quality.

Water suppliers protect drinking water by monitoring for more than 100 potential contaminants. Water suppliers also implement watershed land management and protection practices, as well as disinfect, filter and otherwise treat reservoir water 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 Report**.

Table 1: Public Water System Information

PWS Name	Clinton Water Department
PWS Address	242 Church Street
City/Town	Clinton, MA 01510
PWS ID Number	2064000
Contact	Robert Sweatland
Phone Number	(978) 365-4167

Introduction

We are all concerned about the quality of the water we drink. Reservoir watersheds may be threatened by potential sources of contamination, including stormwater 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.

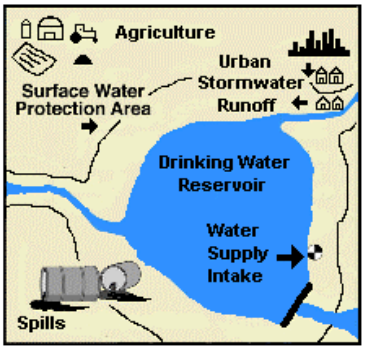
This report includes the following sections:

1. Description of the Water System
2. Land Uses within Protection Areas
3. Source Water Protection Conclusions and Recommendations
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.



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 the watershed boundary.

Section 1: Description of the Water System

Source Name	*Source ID*
Wachusett Reservoir	2064000-03S

The Clinton Water Department draws drinking water from Wachusett Reservoir. The Wachusett Reservoir receives water from its own watershed, the Ware River, and the Quabbin Reservoir. Water from the Ware River and Quabbin Reservoir is received via the Quabbin Aqueduct. The Wachusett Reservoir, Ware River, and Quabbin Reservoir are also sources of the Massachusetts Water Resources Authority (MWRA) and are controlled by the MWRA and Metropolitan District Commission (MDC).

Construction of Wachusett Reservoir began in 1889, and the 65 billion gallon reservoir was completed and filled in 1908. The Wachusett Reservoir watershed includes most of Boylston, West Boylston, Holden, Sterling and Princeton and parts of Clinton, Worcester, Paxton, Rutland, Hubbardston, Westminster and Leominster.

The Ware River watershed includes all or portions of the towns of Barre, Hubbardston, Oakham, Phillipston, Princeton, Rutland, Templeton and Westminster.

In the 1930s, the Swift River was dammed to construct the Quabbin Reservoir. The Quabbin Reservoir watershed includes all or portions of the towns of Athol, Barre, Belchertown, Hardwick, New Salem, Orange, Pelham, Petersham, Phillipston, Shutesbury, Ware and Wendell.

Water from the Wachusett Reservoir passes through the North Dike Station Treatment Plant where the water is disinfected with Sodium Hypochlorite (a form of chlorine) and treated to minimize the leaching of lead and copper from home plumbing with Sodium Hydroxide and Sodium Bicarbonate. 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. Drinking water monitoring reporting data are also available on the web at http://www.epa.gov/safewater/ccr1.html.

Section 2: Land Uses in the Watersheds

The Clinton Water Department benefits from the Watershed Protection Act (Mass. General Law Ch. 92, s. 107A) which applies to the watersheds of the MWRA/MDC system. This Act requires landowners to seek approval for many activities conducted on privately held land in the watersheds. It provides a mechanism to place requirements on land use activities to protect source waters.

In the Wachusett Reservoir watershed sixty-nine percent (69%) of the land is undeveloped forest and wetland. The remaining 31% includes 7% agricultural, 10% residential, less than 1% commercial office or industrial and 13% in other uses such as highways, railways and recreation. Of the 117 square miles of watershed land, forty-six percent (46%) is owned and protected as open space.

Forest and wetland cover 85% of the 96 square miles of the Ware River watershed. Agriculture, residential, commercial and industrial land uses also exist. Fifty-seven percent (57%) of the watershed is owned and protected as open space.

The watershed for Quabbin Reservoir covers 187 square miles. Over 90% of the land is forest and wetland. Small amounts of agriculture, commercial and low-density residential uses are also present. Seventy-five percent (75%) of the watershed is owned by MDC or is controlled by other government agencies or organizations that own and maintain the land as open space.

Watershed Issues

1. **Birds**, particularly gulls, are attracted to large open bodies of water such as the Wachusett and Quabbin Reservoirs. Although birds may increase coliform levels through the release of fecal matter into the water, and may also carry other bacteria and viruses, MDC's gull control program effectively limits potential contamination from birds. Appendix A contains a DEP fact sheet titled *What You Need To Know About Microbial Contamination*.

2. **Beaver and muskrat** may introduce the pathogens *Giardia* and *Cryptosporidium* into water through fecal matter. Because of their constant contact with the water, these aquatic mammals represent a potential threat to drinking water reservoirs. MDC conducts wildlife surveys and water quality monitoring and removes animals as needed to minimize the risk of contamination from this source.

3. **Agriculture** - Agriculture in the Wachusett, Ware River and Quabbin watersheds is a very small percentage of the land use. Crops and hayfields are potential threats because of pesticide and fertilizer use. Animal wastes from stabling or grazing sites may be a source of bacteria. MDC completed a review of agricultural sites within the watersheds and identified BMPs that could be implemented. The list included dairy and livestock farms, grazed lands, crop farms such as orchards, field crops, nurseries and Christmas tree farms. There are also "hobby" farms and residential properties with horses. The Natural Resource Conservation Service and MDC have worked with farmers at prioritized sites to minimize the risk of contamination from these sources.

4. **Transportation Corridors**

   Local Roads and Highways exist close to Wachusett Reservoir, Ware River, and Quabbin Reservoir. Stormwater runoff from roads may contain metals, nutrients, motor oil, sediment and other potential contaminants. Vehicular accidents may cause spills of fuel, chemicals or other substances to flow into storm drains or directly into water bodies. Roads may be sites for illegal dumping of hazardous and other wastes. MDC has completed stormwater management studies and has taken steps to minimize the risk of contamination from stormwater runoff and spills.

   Railroad Rights-of-Way are located within the watersheds. Rights-of-way are potential sources of contamination because of the possibility of spills of transported materials, chemical releases during track maintenance or the over-application or improper handling of herbicides during rights-of-way maintenance.

Benefits of Source Protection

- 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 the DEP staff identified on page eight for more information on Source Protection and the Waiver Program.

Sample Watershed Sign

5. **Transmission (Utility) Lines** are located within the watersheds. These are potential sources of contamination because of the possibility of over-application or improper handling of herbicides during rights-of-way maintenance.

   The Rights-of-Way Management Regulations (333 CMR 11.00) were designed to minimize any potential harmful effects of herbicides use for vegetation control along rights-of-way in Massachusetts. The regulations promote the use of an integrated pest management (IPM) approach to vegetation control and require application setback distances to protect drinking water sources and other environmentally sensitive areas. Utilities must submit a Vegetation Management Plan (VMP) and a Yearly Operating Plan (YOP) to the Massachusetts Department of Food and Agriculture for approval and to the municipalities into which herbicide application is proposed. MDC monitors the YOPs for herbicide application along rights-of-way within the Wachusett, Ware, and Quabbin watersheds.

6. **Residential Land Uses** are located in small amounts within the watersheds (Wachusett=10%, Ware River=4%, Quabbin=1%). Leaks from aboveground and underground fuel storage tanks; improper storage, use and disposal of lawn care fertilizers and pesticides; and failing septic systems are potential sources of contamination at residences. In addition, household hazardous wastes, such as used motor oil, antifreeze, oil-based paints, and medications, must be disposed of properly at a Household Hazardous Waste Collection Day or Center. Appendix A contains a fact sheet titled *Residents Protect Drinking Water.*

   The Watershed Protection Act (Mass. General Law Ch. 92, s. 107A) applies to the watersheds. This Act requires landowners to notify and seek approval for many activities conducted on privately held land in the watersheds. It provides a mechanism to place requirements on land use activities in order to protect source waters. MDC provides more information at www.state.ma.us/mdc/wspa.html.

   When MWRA's Wachusett watershed sewering program is completed in 2004, over one third of the homes and businesses will be able to connect to sewers flowing out-of-watershed. These connections will be very important to the protection of the drinking water.

Issues in the watersheds include:

Land Use	Susceptibility	Potential Source of Contamination
1. wildlife - birds	High	microbial contaminants
2. wildlife - aquatic animals	High	microbial contaminants
3. agriculture	High	manure management, improper handling or over-application of fertilizers or pesticides
4. transportation corridors (stormwater, spills)	High	metals, nutrients, fuels and hazardous materials in stormwater runoff; accidental leaks or spills; over-application or improper handling of pesticides
5. transmission (utility) lines	High	over-application or improper handling of corridor maintenance pesticides
6. residential land uses	Moderate	septic systems, storage tanks, lawn care, household hazardous waste

Note:
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.

***SUSCEPTIBILITY RANKING** - The rankings (high, moderate or low) represent the relative threat of each land use compared to other Potential Sources of Contamination (PSC). 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.

Section 3: Source Water Protection Conclusions and Recommendations

Although land uses within the Wachusett, Ware River and Quabbin watersheds cause those sources to have a high susceptibility ranking, MDC's successful source water protection programs have substantially reduced the risk of contamination.

Clinton Water Department is commended for taking an active role in promoting source protection measures in the Wachusett Watershed through:

- Encouraging storm drain stenciling to warn residents against illegal dumping to storm drains within the watershed.
- Encouraging proper disposal of waste oil at the DPW garage collection center for waste oil.

MDC has prepared and implemented DEP-approved Watershed Protection Plans for their watershed lands. Protection plans include an inventory of land uses and activities, a description of potential sources of contamination, and actions that will reduce or eliminate the risk of contamination. Summaries of these plans and more detailed information about watershed protection can be found on MDC's web site at www.state.ma.us/mdc. Copies of the plans are available for review in the library and Town Hall in each watershed community.

Direct Control of Land - MDC developed a Geographic Information Systems (GIS) based land acquisition model to prioritize undeveloped land in the watersheds on an on-going basis for protection. MDC currently owns 26% of the Wachusett Reservoir watershed, 37% of the Ware River watershed and 57% of the Quabbin watershed. In addition to direct acquisition, other effective options used by the MDC to protect land include conservation restrictions and memoranda of understanding with individual landowners, municipalities, state agencies and conservation groups that control land in the watersheds.

Regulatory Control - The Watershed Protection Act, MGL Chapter 36, was passed by the Massachusetts legislature in 1992 to regulate land uses and activities within the MDC watersheds. The regulations, 350 CMR 11.00, prohibit alteration of the land within 400 ft. of the reservoirs and 200 ft. of tributaries. This is called the Primary Protection Zone. The land between 200 and 400 ft. from the tributaries and certain other lands are designated as the Secondary Protection Zone and activities are subject to review through a formal process established by MDC.

Pathogen Control Program - To reduce the risk of waterborne disease from pathogens, MDC has established a very successful program that includes: discouraging gulls and other birds from landing or roosting on the reservoirs through the use of noise makers, visual objects, and habitat modification; removing muskrat and beaver as needed; recommending BMPs to owners of agricultural sites; sewering areas with wastewater problems; installing stormwater BMPs; and adopting rules for public use of watershed lands.

Partnerships With Watershed Communities - MDC staff realize that their programs need support and assistance from the watershed communities. They assist towns with the development of bylaws, present workshops on planning topics and attend local board meetings. A twice yearly newsletter, *Downstream*, is produced for landowners in the watersheds.

Educational Programs - MDC conducts watershed educational programs for schools, residents, businesses and visitors to MDC lands. From 1996 to the present, over 600 educational programs have been conducted.

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.

What are "BMPs?"

Best Management Practices are structural (e.g., oil & grease trap catch basin), nonstructural (e.g., hazardous waste collection day) or managerial measures that are used to protect and improve surface water and groundwater quality.

Emergency Planning and Response - MDC conducted a Hazardous Materials Emergency Response Study to identify issues and implement improvements to minimize the threat of accidental spills from local roads, highways, utility rights-of-way and railroads. State and federal agencies provide on-going communication and consultation on watershed security issues.

Monitoring Programs - The MDC conducts extensive water sampling in the reservoirs and watersheds to continually assess water quality and performs regular watershed surveys, called sanitary surveys, to identify potential sources of contamination and to set priorities for their protection programs. Clinton Water Department performs extensive monitoring of water from the point where the water leaves the reservoir, through disinfection and treatment, to the consumer's tap. The annual Consumer Confidence Report summarizes the results of the water quality monitoring.

MDC watershed protection programs are very successful and greatly reduce the actual risk of contamination. MDC submits their watershed protection plans to DEP for approval and DEP staff conducts annual inspections to review how the plans are being implemented in the field.

DEP recommends that Clinton Water Department continue to work with MDC on their successful programs to:

- monitor and control birds and aquatic mammals;
- work with farmers to incorporate best management practices into their operations;
- implement projects to improve the control and quality of stormwater and reduce potential threats from spills;
- stay aware of proposed new and expanding development within the watersheds;
- provide technical assistance and educational programs;
- encourage residents to connect to sewer system where available.

Section 5: Additional Resources Available for Source Protection

DEP staff, informational documents and resources are available to help build on this SWAP report and to help improve drinking water protection in watershed communities. Appendix A contains DEP fact sheets titled *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, and Residents Protect Drinking Water*. MDC DWM fact sheets can be obtained at www.state.ma.us/mdc/dwmfactsheets.htm.

Information about DEP Tier Classified Oil or Hazardous Material Release Sites within the watersheds can be obtained at DEP's Bureau of Waste Site Cleanup's web site, www.state.ma.us/dep/bwsc. Sites are identified on the GIS map that is being sent to watershed communities as part of this SWAP assessment and site specific information is available at www.state.ma.us/dep/bwsc/sitelist.htm.

Funding Resources

DEP's Source Protection Grant Program provides funds to conduct local source protection projects. Protection recommendations discussed in this document may be eligible for funding under the grant program. For additional information, please call Kathy Romero at 617-292-5727.

Section 4: Appendices

A. Fact Sheets - *What You Need to Know About Microbial Contamination, Water Suppliers Protect Drinking Water, and Residents Protect Drinking Water*

For More Information

Contact Josephine Yemoh-Ndi in DEP's Worcester Office at (508) 849-4030 for more information and assistance on improving current protection measures.

Copies of this report have been provided to the public water supplier, board of health, and the town.

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 Practices, and general water supply protection information;
2. MA DEP SWAP Strategy;
3. Land Use Pollution Potential Matrix; and
4. Draft Land Use/Associated Contaminants Matrix.