



Massachusetts Department of Environmental Protection Source Water Assessment and Protection (SWAP) Report for Colrain Fire District #1

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

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Table 1: Public Water System (PWS) Information

<i>PWS Name</i>	Colrain Fire District #1
<i>PWS Address</i>	River Road
<i>City/Town</i>	Colrain, Massachusetts
<i>PWS ID Number</i>	1066000
<i>Local Contact</i>	Ms. Dorothy Conway
<i>Phone Number</i>	413-624-8833

<i>Well Name</i>	<i>Source ID#</i>	<i>Zone I (in feet)</i>	<i>IWPA (in feet)</i>	<i>Source Susceptibility</i>
Well #2	1066000-02G	324	1,093	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road de-icing, 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. 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

1. Description of the Water System

Colrain is a small, rural, hilltown community in northwestern Massachusetts along the Vermont border. The Colrain Fire District #1 serves 42 residential connections, a population of approximately 150 people. There is a municipal wastewater treatment facility in Colrain, and municipal sewer is available to serve parts of Colrain but not the area served by the District. Therefore, the area where the well is located is served by on-site septic disposal systems. The District maintains and operates a single 12x18-inch diameter, 60-foot deep, gravel packed well located within the floodplain of the North River. Based on the results of a 48-hour pumping test conducted in 1994 when the well was installed, the source has an approved withdrawal rate of 31 gallons per minute (44,640 gpd). Well #2 (02G) replaced Well #1 (01G), which was a series of three well points that lost capacity and were abandoned.

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 Zone I is the protection area immediately surrounding the wellhead, while the IWPA provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and Interim Wellhead Protection Area (IWPA) radii, based on the daily pumped volume from the well, are 347 feet and 1,392 feet, respectively. Please refer to the attached map of the Zone I and IWPA.

Well #2 is located on the down gradient edge of an unconfined sand and gravel deposit along the North River valley. The deposits were laid down in a bedrock valley during the recession (melting) of the glaciers some 14,000 – 18,000 years ago. More recent alluvial deposits have been laid over the glacial deposits in the floodplain of the North River. There is no record or evidence of a confining, protective clay layer in the vicinity of the well. The bedrock underlying the area is mapped as the lower portion of the Conway Formation, predominantly micaceous schist. Wells located in this type of geologic setting are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the surface. Well #2 is also located within close proximity to the North River and downstream of the leading edge of a large river meander. There has been some concern regarding the long-term stability of the bank of the river as it naturally cuts closer to the well. The riverbank is somewhat stabilized by riprap along the shore nearest to the well.

For information on current water quality monitoring results, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Refer to Table 2 for additional information regarding the location of the well and activities within the protection areas.

2. Discussion of Land Uses in the Protection Areas

The protection areas for Well #2 (02G) include a hay field, the river and forest and floodplain on the east side of the river. Approximately 40% of the IWPA protection area is crop or pasture land. There are few potential sources of contamination within the mapped drinking water supply protection areas. However, the actual recharge area for the source has not yet been delineated.

Key issues include:

1. **Non-conforming Zone I,**

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

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Transportation corridor	No	Yes	Moderate	Limit road salt usage and provide drainage away from wells
Residential	No	Yes	Moderate	Supply BMPs to residents
Agricultural activities	Yes	Yes	Moderate /High	Refer commercial farmers to NRCS for assistance, as needed. Supply hobby farmers with information about BMPs.
Septic components	No	Yes	Moderate	Supply BMPs to residents.

* -For more information, see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website- www.state.ma.us/dep/brp/dws/.

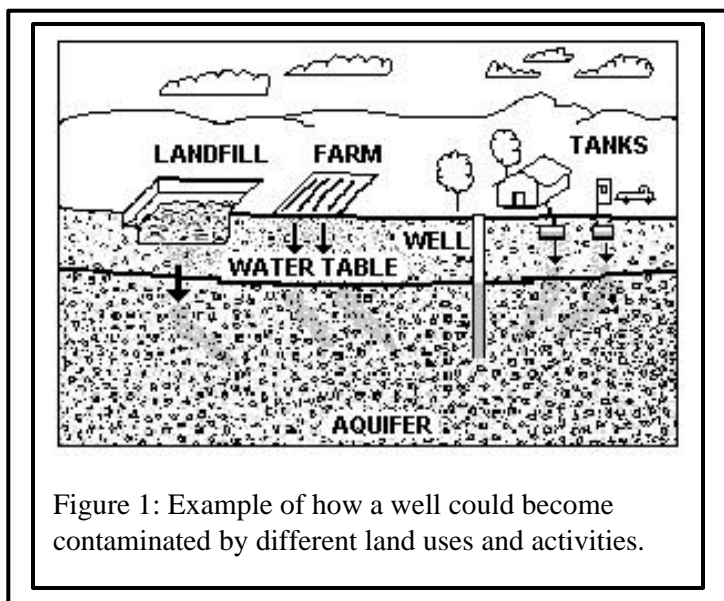


Figure 1: Example of how a well could become contaminated by different land uses and activities.

2. **Transportation corridor,**
3. **Residential land use, and**
4. **Agricultural uses.**

The overall ranking of susceptibility to contamination for the Colrain Fire District #1 supply well (02G) is moderate based on the presence of several moderate ranked potentially threatening land uses or activities in the Zone I and IWPA. Please refer any questions about water quality at the facility to the contact person listed in Table 1.

1. Non-conforming Zone I – The water supplier does not own or control the entire Zone I area. 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 District owns the Zone I west of the river but does not own the Zone I east of the North River. The Zone I land across the river is presently forest. Only hay is grown in the field within the Zone I west of the river.

Zone I Recommendations:

- V Monitor proposed activities east of the river and consider acquiring Zone I through ownership or land use controls. Consider purchasing a Conservation Restriction or entering into an agreement for Right-of-First Refusal if there appears to be a potential for development of the land. Continue to control access to the wellhead area.
- V Use Best Management Practices for handling treatment chemicals and vehicles used to access the area.
- V Continue to prohibit the use and storage of pesticides, fertilizers or manure within the Zone I.

2. Residential Land Use – There are several residences within the IWPA protection area. 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 systems leach to the ground. If septic systems fail or are not properly maintained they could be a potential source of microbial contamination.
- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and 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** – Catch basins 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.

3. Transportation corridor – The well is located on State Route 112. The greatest threat from the road is deicing materials, an accidental spill and or illegal access.

Transportation corridor Recommendations:

- V Work with the Town/State to ensure that road runoff is directed where feasible, to an area downgradient (south) of the well.
- V Prepare an Emergency Response Plan that includes coordination between the DEP, the Fire District, the Town, MA highway and State Police in the event of an accident near the wellhead.
- V Consider fencing the area if access becomes an issue in the future.

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 I. 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.

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 the Drinking Water Program web site at:

www.state.ma.us/dep/brp/dws/

Copies of this assessment have been made available to the public water supplier and town boards.

4. Agricultural Activities – The protection areas include a large percentage, approximately 40%, of land for agricultural activities. Pesticides, fertilizers and manure have the potential to contaminate a drinking water source if improperly stored, applied, or disposed. 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. Frequently, farms and golf courses have maintenance garages for equipment and storage tanks.

Agricultural Activities Recommendations:

- ✓ Work with farmers in your protection areas to make them aware of your water supply and to encourage the use of a USDA Natural Resources Conservation Service (NRCS) farm plan to protect water supplies. Call the local office of the NRCS in Greenfield for assistance or refer to the fact sheets available online at the website <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.
- ✓ Encourage farmers to incorporate an Integrated Pest Management (IPM) approach into their pest management program. 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.
- ✓ Promote the use of BMPs for fuel oil storage, hazardous material handling, storage, disposal, and emergency response planning.
- ✓ Continue your current work with farmers, and include hobby farmers, to ensure that pesticides and fertilizers are being stored within a structure designed to prevent runoff.
- ✓ The USDA has various funding sources for government agencies, non-government organizations and agricultural facilities through programs such as those listed on the USDA web site <http://search.sc.egov.usda.gov/>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available that is available online at the NRCS website: <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>. Call the local office of the NRCS for assistance. The Colrain highway superintendent may find this information useful.
- ✓ Work with hobby farmers by supplying them with information about protecting their own wells and the public water supply by encouraging the use of BMPs. Refer hobby farmers and interested parties to the following websites for additional information: <http://www.state.ma.us/dep/brp/dws/dwspubs.htm> and <http://www.state.ma.us/dep/consumer/animal.htm#dwqual>.

5. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The water supplier should review and adopt the key recommendations above and the following:

Priority Recommendations:

- V Continue efforts to control access to Zone I and monitor activities in the IWPA area.
- V Consider having the Zone II for the well delineated so that protection can be focused in areas that are within the actual contribution area of the well.

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

Zone I:

- ✓ Prohibit any new non-water supply activities from the Zone I.
- ✓ Continue regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- ✓ Inspect drainage within the Zone I and monitor the stability of the riverbank regularly.
- ✓ Continue your current practice of prohibiting the use of pesticides, fertilizers or spreading of manure within the Zone I.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous materials.
- ✓ Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- ✓ Educate neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.
- ✓ Keep areas near transformers free of tree limbs that could endanger the transformer in a storm.

Planning:

- ✓ Consider investing in the delineation of a Zone II contribution area to improve protection planning for the well. This same recommendation was made to the

Griswoldville water supplier. In the meantime, work with local planning and Board of Health officials in Colrain to develop Aquifer Protection District Bylaws and to include the Colrain supply IWPA in that district. Work with the Shelburne and Griswoldville water suppliers to request protection planning in Colrain.

- ✓ 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 in the event of an emergency.
- ✓ Supplement the SWAP assessment with additional local information, and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Other Funding Sources:

Other grants and loans are available through the 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 USDA also has various funding sources for government agencies, non-governmental organizations and agricultural facilities through programs listed on the USDA web site <http://search.sc.egov.usda.gov/nrcs.asp?qu=eqip&ct=NRCS>. One program in particular, the Environmental Quality Incentives Program (EQIP) may be utilized in a variety of projects from DPW stormwater management to farm nutrient management designed to protect surface and groundwater. Review the fact sheet available on line and call the local office of the NRCS for assistance <http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/EQIPFct.pdf>.

The DEP's Wellhead Protection Grant Program provides funds to assist public water suppliers and their partners in addressing water supply source protection through local projects. Protection recommendations discussed in this document may be eligible for funding under this grant program. If funds are available, in the spring, DEP posts a new Request for Response for the grant program (RFR).

These recommendations are only part of your on-going 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 Areas
- Recommended Source Protection Measures Fact Sheet