Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Cape Cod Air Force Station

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.

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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October 2003

Table 1: Public Water System (PWS) Information

PWS NAME	Cape Cod Air Force Station
PWS Address	Massachusetts Military Reservation
City/Town	Bourne
PWS ID Number	4036008
Local Contact	Stephanie Syler
Phone Number	(508) 968-3321

Well Name	***Source ID#***	***Zone I (in feet)***	***IWPA (in feet)***	***Source Susceptibility***
Well #1	4036008-01G	400	2320	High
Well #2	4036008-02G	400	2320	High

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 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. 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
5. Appendix

1. Description of the Water System

The Cape Cod Air Force Station has two groundwater wells that provide drinking water to the facility. Well #1 is located adjacent to the facility and serves as a back-up water source. Well #2 acts as the primary source and is located in the woods north of the facility and is secured by a chain link fence. Both wells have Zone I radii of 400 feet and Interim Wellhead Protection Area (IWPAs) radii of 2320 feet. 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 well is located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant

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).

migration. Please refer to the attached map of the Zone Is and IWPAs.

The wells serving the facility are disinfected with chlorine at this time. The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web via EPA's Envirofacts website at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html.

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 that are potential sources of contamination.

Key issues include:

1. **Non-Water Supply Activities in Zone I;**
2. **Above Ground StorageTanks (ASTs);**
3. **Septic System, and**
4. **Road and Vehicle Parking**.

The overall ranking of susceptibility to contamination for the well is high, based on the presence of high ranked threats within the Zone I and IWPA.

1. **Non-Water Supply Activities in Zone I –** Currently, Well #1 does not meet DEP's Zone I regulations, which allow only water supply related activities in the Zone I and require that the land within the Zone I be owned or controlled by the public water system. The Zone I for Well #1 contains facility buildings that includes above ground storage tanks with diesel fuel. The Zone I for Well #2 meets DEPs Zone I requirements. 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:

✓ Ensure all above ground atorage tanks and piping is properly contained and monitored for leaks.

✓ Do not use or store pesticides, fertilizers or road salt within the Zone I.

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

Potential Contaminant Sources	Zone I	IWPA	Threat	Potential Concern
Hazardous waste storage (waste oil)	No	Yes Wells #1 and 2	High	Mishandling spills and leaks
Above ground storage tanks (eight)	Yes Well #1	Yes Wells #1 and 2	Moderate	Potential for leaks and spills. Please note that all tanks are double walled or vaulted.
Septic system	Yes Well #1	Yes Wells #1 and 2	Moderate	Bacteria, improper disposal of hazardous materials
Parking lot	No	Yes Wells #1 and 2	Moderate	Stormwater runoff, spills
Road	No	Yes Wells #1 and 2	Moderate	Stormwater runoff, spills

*** 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.

2. **Aboveground Storage Tank (AST) –** There are ASTs with containment located within the IWPAs and Zone I for Well #1. Seven tanks hold dielsel fuel and one contains waste oil (hazardous waste). If managed improperly, above ground storage tanks can be a potential source contamination due to leaks or spills of the chemicals they store. An inventory of the ASTs is kept by the Air Force.

   Recommendations:

✓ Inspect and maintain the integrity of the containment structure.
✓ Monitor for leaks.
✓ Ensure BMPs are in place to avoid spills during fill-up or transfer of contents.

3. **Septic System –** The septic system for the facility is located within the Zone I for Well#1.

   Recommendation:

✓ Septic system components should be inspected and maintained on a regular basis.

4. **Road and Vehicle Parking–** Part of a road and vehicle parking is within the the IWPA. Runoff and spills from roads can contaminate public wells.

   Recommendation:

✓ Ensure runoff is directed away from the wells.
✓ Include spill containment and drainage mapping as part of your emergency plan.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The Cape Cod Air Force Station is commended for constructing containment for their above ground tanks. Officials should review and adopt the key recommendations above and the following:

Priority Recommendations:

Zone I:

✓ Consider well relocation for Well #1.

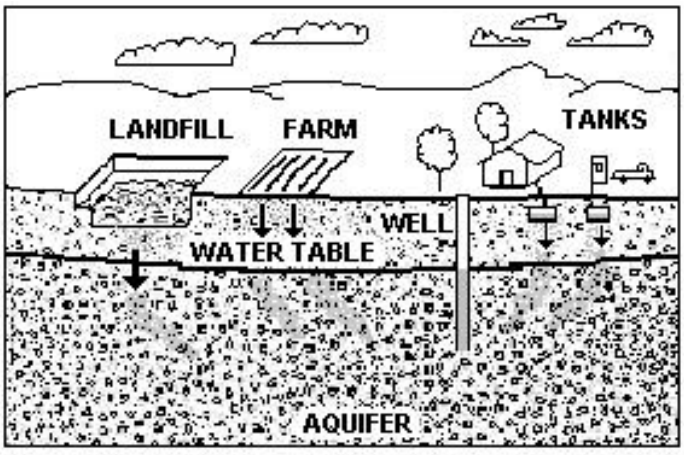

Figure 1: Example of how a well could become contaminated by different land uses and activities.

✓ Keep additional non-water supply activities out of the Zone I.
✓ Post water supply protections signs in the Zone I and IWPA.
✓ Continue to conduct regular inspections of the Zone I. Look for illegal dumping or evidence of vandalism.
✓ Use Best Management Practices (BMPs) and restrict activities that could pose a threat to the water supply.
✓ Keep road and parking lot drainage away from the well.
✓ Do not use or store pesticides, fertilizers or road salt 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 waste.

Facilities Management:

✓ Inspect and maintain the integrity of the containment structure for the AST. Monitor for leaks.

For More Information:

Contact Isabel Collins in DEP's Lakeville Office at (508) 946-2726 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 made available to the public water supplier and town boards.

- ✓ Septic system components should be located, inspected, and maintained on a regular basis.

Planning:

- ✓ 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.

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 that program. For additional information, please refer to DEP's web site. 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.

Officials should use this SWAP report to spur discussion of drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area.
- Recommended Source Protection Measures Fact Sheet
- Your Septic System Brochure
- Industrial Floor Drains Brochure
- Source Protection Sign Order Form