

Do-it-Yourself Wellhead Protection Plan

for Community and Non-Transient,
Non-Community public water
systems serving less than 250 people

| A Publication of the Maine Drinking Water Program



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Part 1: Well Information



Filling out the form

For each well in your water system, fill in:

1. A description of where the well is located.
2. The coordinates of the wellhead (in either decimal degrees or dd°mm'ss").
3. The depth of the well.
4. The yield of the well.
5. The casing size.
6. The date installed.

If you do not have all the information necessary to fill out this form, you may be able to find it in the following places:

- Your most recent Sanitary Survey.
- Well drillers typically record the depth, yield, and date drilled. Contact the company that drilled your well.
- Well drillers typically record the depth, yield, and date drilled on the bottom of the well cap. Remove your well cap, being extremely careful not to dislodge any debris, which may fall into the well.
- The Maine Drinking Water Program (DWP) offers geographically referenced water well data to the public via Google Earth. You will need to have Google Earth installed to view the data. The link to download Google Earth can be found on the Public Water Resource Information System webpage. You will also have to register with the DWP in order to access the data. The registration form is linked to the Public Water Resource Information System webpage as well. Detailed instructions on how to register and how to access the data can be found at http://www.maine.gov/dep/gis/datamaps/DWP_Wells. While accessing this database, you may find that your well is not included, or is mapped in the wrong place. If either of these situations occur, or if you need assistance, contact the DWP.
- The Maine Geological Survey Water Well database may also have data about your well. This database can be accessed from their website, <http://www.maine.gov/dacf/mgs/pubs/digital/well.htm>.

Example

| | | |
|----------------------|---|----------------------------------|
| Well #: <u> 1 </u> | Location Description: on the southwest corner of the lot | |
| | Coordinates: 44° 6'17.81" N, 69° 49'13.73" W (this is dd°mm'ss") | |
| | Depth (ft.): 250 | Yield (GPM): 3 |
| | Casing Size (in.): 6 | Date Installed: 7/27/2010 |

Part 2: Potential Sources of Contamination



For small community water systems and non-transient, non-community water systems, the default wellhead protection area is a 300-ft radius circle, centered on your wellhead. If you have multiple active wellheads, multiple wellhead protection areas will apply. In some cases, these areas will overlap. You may find it easier to complete Part 2 (Potential Sources of Contamination), and Part 3 (The Map) concurrently.

This DWP form lists 37 potential sources of contamination (PSCs) in 4 broad categories: those derived from Herbicide / Pesticide Use, Petroleum / Hydrocarbon Use, and Bacterial / Inorganic Chemicals and Other. These sources have the potential to generate mineral, chemical, and biological substances that may significantly contaminate groundwater.

Filling out the form

For each well in your system, fill in:

1. Fill in:

- Your PWS name.
- Your PWSID #.
- The date you filled out the form,
- The name of your DWP Field Inspector.

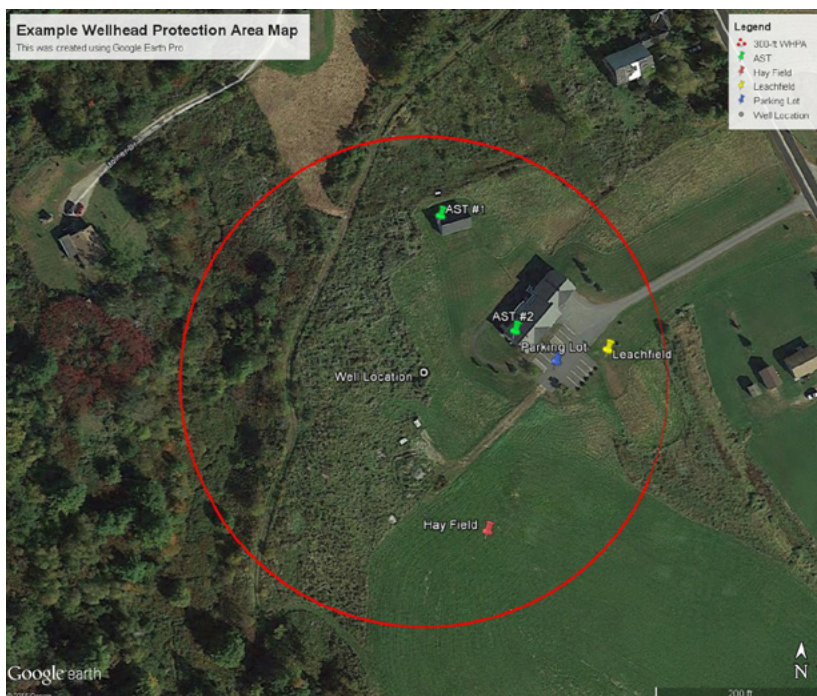
2. For each wellhead in your system, indicate the number (if any) of PSCs within a 300-ft radius circle of your wellhead in the column marked “Number of Occurrences”.

3. Measure the distance from your wellhead(s) to the PSCs you have identified and enter it in the column marked “Distance to Well (in feet)”. For PSCs that have a large footprint, you should measure from the point of the PSC closest to the wellhead.

Keep in mind that several potential sources of contamination may overlap. For example, residential homes can be sources of bacteria and inorganic chemicals (from failed septic tank), sources of pesticide / herbicide use (from lawn care), as well as petroleum / hydrocarbon use (from above ground home heating fuel oil tanks).

Example

In this example, there are 5 potential contaminant sources within the wellhead protection area: 2 above ground storage tanks for home heating fuel oil, a parking lot, a septic system, and an active hay field.



Part 2: Potential Sources of Contamination (PSC)

| PWS Name: Example System | | PWSID#: ME000000 | Date: 01/01/01 |
|--|------------------|----------------------------|-----------------------|
| DWP Field Inspector Name: Jane Smith | | | |
| PSC | # of Occurrences | Distance to Well (in feet) | |
| Herbicide / Pesticide Use | | | |
| Agricultural chemical spreading or spraying (pesticides, herbicides, or fertilizers) | 1 | 117 | |
| Pesticide, herbicide, or fertilizer storage | | | |
| Golf course | | | |
| Nursery or garden shop | | | |
| High voltage transmission lines | | | |
| Petroleum / Hydrocarbon Use (VOCs or Semi-VOCs) | | | |
| Aboveground oil storage tank (including home heating oil tanks) | 2 | 112,184 | |
| Underground oil storage tank | | | |
| Airport | | | |
| Auto or small engine repair or body shop | | | |
| Concrete, asphalt, tar, coal company | | | |
| Gas station, service station | | | |
| Parking lot | 1 | 135 | |
| Sand and gravel mining, other mining | | | |
| Snow dump (large commercial or municipal) | | | |
| Truck terminal | | | |
| Bacteria and Inorganics , such as Nitrates / Nitrites | | | |
| Animal burial (large scale site) | | | |
| Animal grazing or barnyard | | | |
| Manure pile or spreading | | | |
| Septic system, septic waste disposal | 1 | 217 | |
| Sewer line | | | |
| Sludge disposal or spreading | | | |
| Wastewater treatment plants or discharge | | | |
| Industrial Solvents and Other Chemicals | | | |
| Dry Cleaner | | | |
| Furniture stripper | | | |
| Boat builder, refinisher, maintenance | | | |
| Industrial manufacturer | | | |
| Metal plating | | | |
| Military facility | | | |
| Landfill, dump, transfer station | | | |
| Wood preserver | | | |
| Other | | | |
| Railroad yard or line | | | |
| Residential home | | | |
| Salt pile or sand & salt pile | | | |
| Abandoned well | | | |
| Graveyard & cemetery | | | |
| Incinerator | | | |
| Other: | | | |

Part 3: The Map



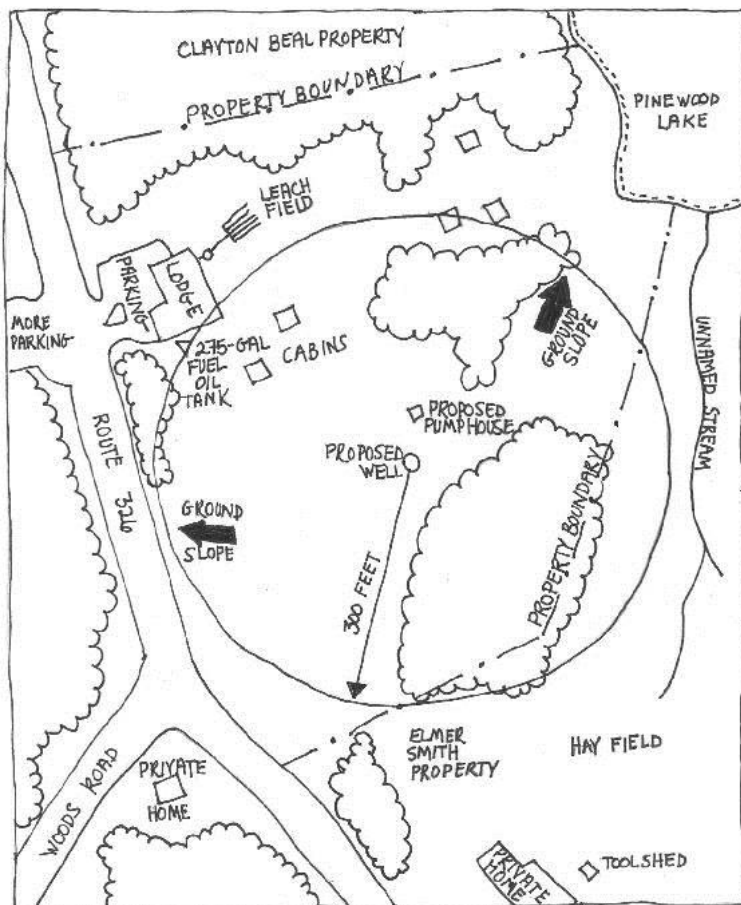
The two simplest techniques you can use to develop your wellhead protection map are to create a scaled drawing by hand (Example 1), or an electronic map using Google Earth and the DWP's Public Water Resource Information System (Example 2), described in the instructions for Section 1, on Page 1 of this booklet. You may find it easier to complete Part 2 (Potential Sources of Contamination), and Part 3 (The Map) concurrently.

Example 1: The hand drawing method.

For small community water systems and non-transient, non-community water systems, the default wellhead protection area is a 300-ft radius circle, centered on your wellhead. If you have multiple active wellheads, multiple wellhead protection areas will apply. In some cases, these areas will overlap.

Helpful resources to use are USGS topographic maps, a compass and a tape measure. An aerial photograph may also help. Consider using graph paper when creating your drawing, as it should be as close to scale as possible.

1. Using some sort of measuring device (tape measure, measuring wheel, measured paces, etc.), mark off a 300-ft radius around your wellhead.
2. Refer to the PSC table in Part 2, and mark the location of each PSC on the map.
3. Measure the distance from each PSC to your wellhead(s).

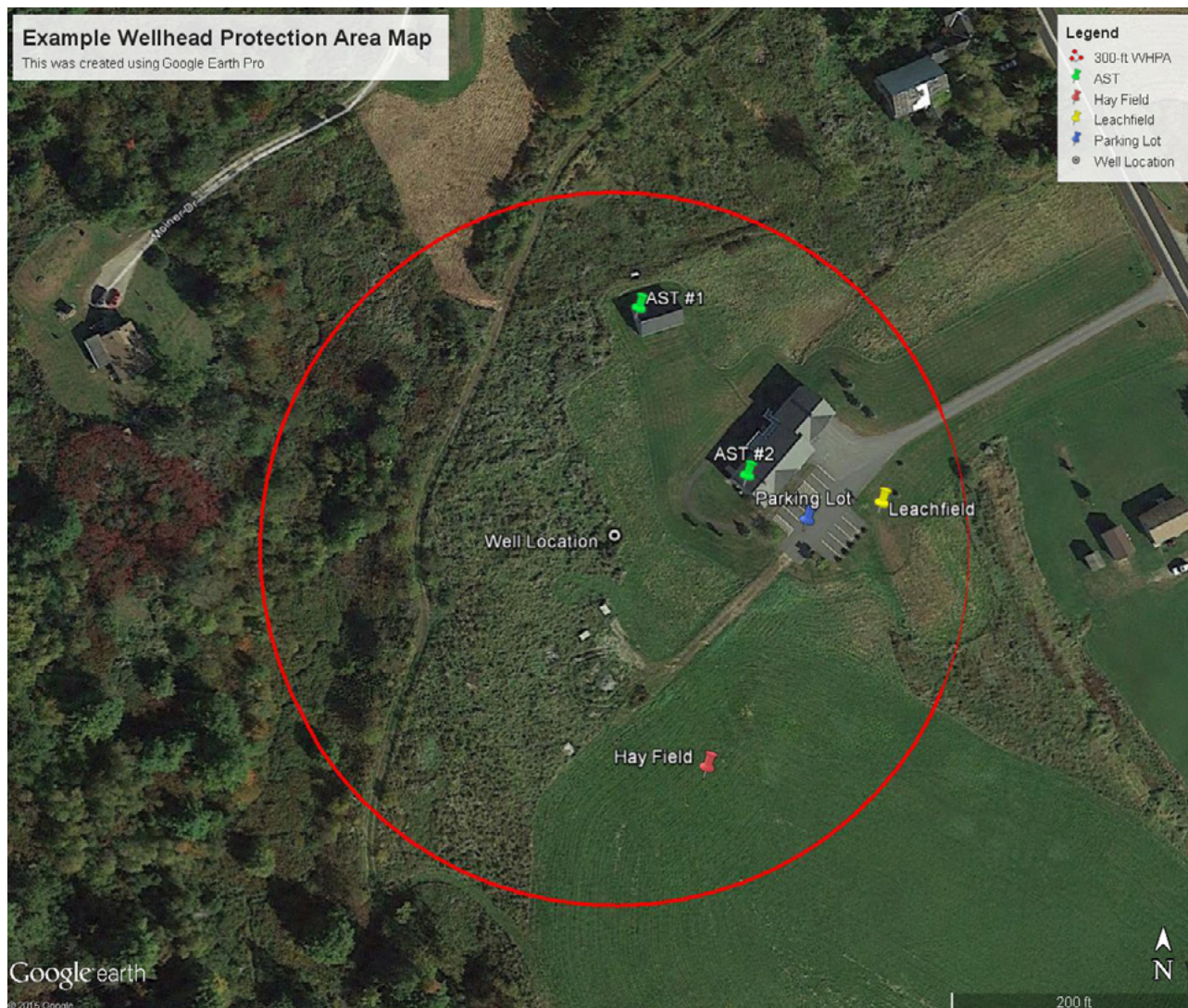


! Keep in mind that several potential source of contamination may overlap. For example, residential homes can be sources of bacteria and inorganic chemicals (from failed septic tank), sources of pesticide / herbicide use (from lawn care), as well as petroleum / hydrocarbon use (from above ground home heating fuel oil tanks).



Example 2: The computer drawing method.

You can use the Public Resource Information System and Google Earth to create a computer drawn map. Once you access the Public Water Resource Information System and download the files to your Google Earth application, you can easily create maps such as the one below.



Detailed instructions on how to register, access the information, and how to download Google Earth can be found at http://www.maine.gov/dep/gis/datamaps/DWP_Wells.

You will have to **Download Google Earth and Register** with the DWP, in order to download the file called “DWP_Private.kml”. Follow the instructions on the website to download the software, and open the application.

After opening Google Earth, you will be able to search for your water system by zooming into your town. If your wellhead is not mapped, or if it is mapped incorrectly, contact the Drinking Water Program.

Part 4: Action Plan



Fill in the form with an appropriate management action, activity, start date, and time frame in which to implement or complete the action. This is the most important part of the plan, and should remain updated with new activities on a regular basis.

List each PSC you recorded in Parts 1 and 2.

Consider the type of PSC and devise an activity that you could under take to reduce the risk of contamination. This can be something you have direct control over, or it could be just reaching out to your neighbor. Multiple activities may apply to one PSC. Remember, no one will know about wellhead protection unless you tell them!

Example:

| PSC | Management Actions | Date Started | Time Frame |
|---------------------------|---|--------------|--------------------|
| Aboveground Storage Tanks | Tank inspection program for both tanks | 01/02/16 | monthly |
| Aboveground Storage Tank | Apply for funding to replace AST | 01/03/16 | Next funding cycle |
| Parking lot | Plant buffer strip to intercept storm water runoff | Summer of 16 | Summer of 16 |
| Hayfield | Outreach - contact neighbor and provide information about public water supply | 06/12/16 | One time |
| Septic System | Septic pumping program; staff training on appropriate wastes for septic system through Safe Homes Program | 07/04/16 | annually |



The following list includes several options for management actions, followed by a list of resources available to help you plan and carry out these actions.

Management Action:

• Outreach and education

Inform property owners near your wellhead that you own a regulated public water supply and that you would like their assistance to protect drinking water quality. You can do this by handing out information, writing a letter, or if you're a Community Water System, including it in your annual Consumer Confidence Report. Most people just don't know where their water comes from, or what they can do to protect it. Letting them know what they can do to protect their drinking water source can go a long way.

• Safeguarding your AST

External home heating fuel oil tanks are exposed to extremes in temperature and weather. The Maine Department of Environmental Protection has prepared an inspection checklist designed to help prevent tank failures. Also consider installing filter protection if you have not already done so. The checklist is called "Is Your Tank in Shape?" and is available online at <http://www.maine.gov/dep/waste/publications/isyourta.html>.

• Replacement of ASTs or Conversion of fuel oil to propane or natural gas

The Maine Department of Environmental Protection reports an average of one above ground home heating fuel oil tank spill a day. Spilled oil can leach into groundwater and contaminate drinking water supplies. Removing old tanks and replacing them with tanks with secondary containment can prevent accidental fuel oil spills. Converting heating systems from oil fuel to propane (or natural gas if available) will remove the threat to groundwater altogether. Tank replacement and fuel conversion can be costly. Grant assistance from the Maine Drinking Water Program and the Maine Department of Environmental Protection may be available.

• Reduction in use of salt on roadways

If you can, reduce the amount of salt in parking lots and roadways near your wellhead. Road salt is a source of chloride contamination in drinking water wells. Excessive chloride can cause corrosion of indoor plumbing pipes and fixtures, like hot water heaters and faucets. Depending on the road type, you may contact your local Road Commissioner, or the Maine Department of Transportation to investigate the possibility of creating a "low-salt" zone around your well.

• Reduce the use of chemicals

Various land use practices like agriculture, industrial factories, and commercial industries may introduce organic chemicals into groundwater. In chemistry, "organic" is a term used to describe substances that contain the element carbon. Carbon is one of the most common elements in the world, and there are many natural and man-made organic chemicals in existence. Herbicides, pesticides, solvents, and petroleum products (like home heating oil and gasoline) are examples of organic chemicals. There are 52 organic chemicals regulated by the Safe Drinking Water Act. Long-term exposure to these substances in drinking water can cause cancer, reproductive and nervous system damage in adults, and cause harm to developing children. Organic



chemicals are frequently characterized as Volatile Organic Compounds (VOCs), which means they evaporate very quickly and easily, and Synthetic Organic Compounds (SOCs), which means they are man-made.

Both nitrate and nitrite are water-soluble and found in fertilizers (as well as in animal wastes). The biggest concern regarding nitrate is for infants less than 6-months old. If fed water containing nitrate concentrations above 10 parts per million, an infant may develop a condition called methemoglobinemia or blue baby syndrome. The baby's skin appears blue-gray in color, caused by a lack of oxygen in the blood. An infant suffering from this condition requires immediate medical care to prevent potential coma and/or death. Nitrate contamination may occur in areas downgradient of septic systems and other sources of sewage, and downgradient of animal husbandry practices and fertilizer use.

When used or disposed of incorrectly, these chemicals can leach into groundwater and pose a threat to drinking water quality. Reducing the use of these materials, or using safe alternatives, such as integrated pest management, will help protect groundwater quality.

- **Properly maintain your septic system**

Pathogens and nitrogen are found in animal wastes. Pathogens are disease causing bacteria and viruses, and nitrogen is a waste product that becomes nitrate or nitrite in the environment (see discussion above). Pathogens generally cause acute gastrointestinal distress including nausea, vomiting and diarrhea, and illnesses such as salmonella, cholera, and typhoid fever, polio and hepatitis A. For those with compromised immune systems, exposure to a pathogen can be fatal.

Proper septic system maintenance greatly reduces the risk of contamination of your well from waste products and pathogens.

- **Stormwater management**

Surface flow of water during a storm event can dissolve and carry a host of pollutants that may be harmful to groundwater quality. Chemicals, spilled motor fuel oil, excess road salt, and pet wastes are examples of what stormwater may pick up. If your wellhead is located in an area that receives stormwater, like a drainage ditch or swale, it is at a higher risk of contamination. Re-directing the flow of stormwater away from the wellhead will help to prevent contamination.

- **Physical protection of the wellhead**

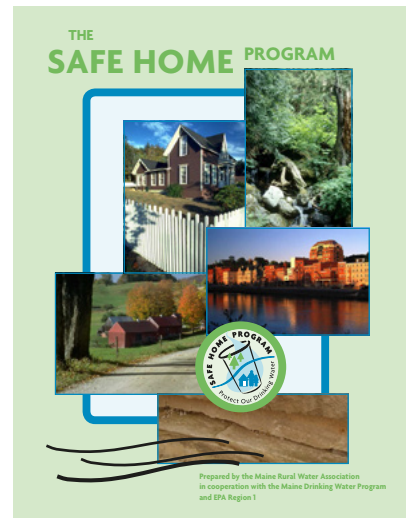
Sometimes, the best thing to do to protect your well is to protect it from tampering. If you cannot secure your well, consider installing a locking sanitary well cap. If your well is located in a high traffic area, such as in or near a parking lot, consider installing crash barriers, or a fence around the wellhead. The Maine Drinking Water Program offers grant assistance for these activities. Information may be found on the Financial Resources webpage of the Maine Drinking Water Program website, www.medwp.com. Look for the grant programs called "*Sanitary Seal Well Cap Program*" and "*Wellhead Protection Grant Program*."



Resources:

The following list of resources may be helpful in developing your Action Plan. There are many wellhead protection planning resources available online, and these are just a small sample to point you in the right direction. They contain a wealth of information and may possibly provide inspiration for solutions that fit your unique circumstances. If you need additional assistance, refer to the contacts in the Wellhead Protection Plan booklet, or call the Drinking Water Program at 207-287-2070.

- *The Safe Home Program* is a collection of fact sheets developed by the Maine Rural Water Association and the Maine Drinking Water Program. Designed specifically for homeowners, this collection of 7 fact sheets contain tips and information for protection of groundwater and surface water quality. Easy to read descriptions of watersheds; water flow through the environment; septic wastes; household hazardous wastes; fuel use and storage; safe land and animal care; and important contacts are included in the packet. You can download the entire *Safe Home* packet from the Source Water Protection page of the Maine Drinking Water Program website, www.medwp.com.
- The EPA Fact Sheet *“Do’s and Don’ts around the Home”* highlights residential use of household chemicals, landscaping and gardening, septic systems, and water conservation. This fact sheet can be accessed <http://water.epa.gov/polwaste/nps/dosdont.cfm>.
- The Drinking Water Program Fact Sheet, *“Do’s and Don’ts: Protecting Your Wellhead and Drinking Water Supply”* highlights what you as a public water provider can do to protect your wellhead. Septic systems, Fuel use and storage, Household chemicals, Yard maintenance and animal care, and outreach are covered on this sheet. It can be accessed at <http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/wrt/documents/dosDontsWHParea.pdf>
- The EPA Fact Sheet, *“What you can do (to protect your well)”*, can help you identify potential sources of contamination. You can access this sheet at <http://water.epa.gov/drink/info/well/whatyoucando.cfm>.
- The NRCS Backyard Conservation Tip sheet – *“Nutrient Management in your Backyard”* has information on soil testing, fertilizers and soil amendments, and fertilizer application. This sheet can be accessed at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/features/?cid=nrcs143_023538.
- The NRCS Backyard Conservation Tip sheet – *“Pest Management in your Backyard”* discusses the different types of pests found in the backyard, and how best to manage them. This sheet can be accessed at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/features/?&cid=nrcs143_023552.





- The Maine Drinking Water Program Source Protection website, www.medwp.com contains links and information for wellhead protection as well as grants for wellhead protection and installing locking sanitary well caps.
- The Maine Department of Environmental Protection has information on *Aboveground Home Heating Oil Storage Tank Replacement or Fuel Conversion* on their website, <http://www.maine.gov/dep/waste/abovegroundtanks/replacement.html>.
- The Maine Department of Transportation or your local Road Commissioner may be able to assist in creating a “low-salt” zone around your well.
- Your town may be your best resource for long term protection. Sadly, public water systems’ source protection areas are rarely protected by municipal ordinances. You may be able to approach your town and develop a wellhead protection ordinance. This is a long process, but in the end, perhaps the best insurance a public water supplier may have against off-property contamination. Remember, if you don’t own it, zone it.

You can contact the Maine Rural Water Association (www.mainerwa.org) or RCAP Solutions (www.rcapsolutions.org) for assistance with local ordinances.