Farm-A-Syst

Farmstead Assessment System Worksheet 4

Assessing the Risk of Groundwater Contamination from Petroleum Product Storage

Why should I be concerned?

Above-ground and underground storage of liquid petroleum products such as motor fuel and heating fuel presents a threat to public health and the environment. Nearly one out of every four underground storage tanks in the United States show evidence of a discharge, according to the U.S. Environmental Protection Agency. If an underground petroleum tank is more than 20 years old, especially if it's not protected against corrosion, the potential for leaking increases dramatically. Newer tanks and piping can leak too, especially if they weren't installed properly.

Even a small gasoline leak of one drop per second can result in the release of about 400 gallons of gasoline into the groundwater in one year. A few quarts of gasoline in the groundwater may be enough to severely pollute a farmstead's drinking water. At low levels of contamination, fuel contaminants in water cannot be detected by smell or taste, yet the seemingly pure water may be contaminated to the point of affecting human health.

Preventing tank spills and leaks is especially important because gasoline, diesel and fuel oil can move rapidly through surface layers and into groundwater. Vapors from an underground leak that collect in basements, sumps or other underground structures have the potential to explode. Selling property with an underground tank may also be difficult.

Petroleum fuels contain a number of potentially toxic compounds, including common solvents, such as benzene, toluene, and xylene, and additives such as ethylene dibromide (EDB) and organic lead compounds. EDB is a carcinogen (cancer causing chemical) in laboratory animals, and benzene is considered a human carcinogen.

This worksheet focuses on storage of gasoline, kerosene and liquid heating fuels. It does not apply to LP (liquid propane) gas, since leaks vaporize quickly and do not threaten groundwater.

The goal of Farm-A-Syst is to help you protect the groundwater that supplies the drinking water for you, your neighbors, and the public. It is not used for, nor is it related to, any type of enforcement action from any agency.

How will this worksheet help me protect my groundwater?

- It will take you step by step through your petroleum product storage practices.
- It will rank your activities according to how they might affect the groundwater that provides your drinking water supplies.

- It will help you determine which of your practices are reasonably safe and effective, and which practices might require modification to better protect your drinking water.

How do you fill out the worksheets?

Focus on the well that provides drinking water for your home or farm. If you have more than one drinking water well on your farmstead, fill out a worksheet for each one.

- Use a pencil. You may want to make changes.
- For each category listed on the left that is appropriate to your farmstead, read across to the right and circle the statement that best describes conditions on your farmstead. (skip and leave blank any categories that don't apply to your farmstead.)
- Then look above the description you circled to find your "Rank number" (4, 3, 2, or 1) and enter that number in the blank under "Your Rank."
- Directions on overall scoring are explained in the next section "What do you do with the rankings?"
- Allow between 20-45 minutes to complete the worksheet and figure out your risk ranking for well management practices.
- **When you see this symbol  behind any text in the worksheet you will know that it is an illegal activity. Remember this is for your use and will not in anyway lead to enforcement.**

What do you do with the rankings?

Step 1: Look over your rankings for individual activities:

- Low-risk practices (4's): ideal; should be your goal despite cost and effort
- Low-to-moderate-risk practices (3's): provide reasonable groundwater protection
- Moderate-to-high-risk practices (2's): inadequate protection in many circumstances
- High-risk practices (1's): inadequate; pose a high risk of polluting groundwater

Any individual rankings of "1" require immediate attention. Some concerns you can take care of right away; others could be major-or costly-projects, requiring planning and prioritizing before you take action.

Find any activities that you identified as 1's & 2's and list them under "High Risk and Medium-High Risk Practices" at the end of this section.

Step 2: Read Fact Sheet # 4, “Improving Petroleum Product Storage”, and consider how you might modify your farmstead practices to better protect the public’s and your drinking water.

Step 3: Fill out the Farmstead Improvement Action Plan (FIAP). Contact your local Soil and Water Conservation District for technical assistance and help with the FIAP if needed.

Step 4: Implement the FIAP- Contact NRCS for possible designs and/or funding for practices. Funding availability depends on the practice installed and the current USDA farm programs.

Glossary

Petroleum Product Storage

These terms may help you make more accurate assessments when completing Worksheet #4. They may also help clarify some of the terms used in Fact Sheet #4.

Certified inspector: A person certified by the State of Maine Board of Underground Storage Tank Installers (BUSTI) to inspect underground petroleum storage tanks and underground petroleum piping.

Certified installer: A person certified by the State of Maine Board of Underground Storage Tank Installers (BUSTI) to install, inspect, and repair underground petroleum storage tanks and underground petroleum piping.

Galvanized: The result of coating an iron or steel structure with zinc. Galvanized materials do not meet underground corrosion protection requirements.

Interstitial space: The space between the primary pipe or tank and the outer pipe or tank of a double wall system. Also called secondary containment.

Inventory control: Measuring and comparing the volume of tank contents regularly with product delivery and withdrawal records to help detect leaks before major problems develop.

Normally closed valve: An electrically operated solenoid valve or a valve operated mechanically by fluid flow (usually by a vacuum created downstream of the valve) that is open only when product is called to flow in the piping. This valve prevents siphoning of fuel from the tank in case of pipe rupture.

Secondary containment: A system such as a dike or double walled piping that will catch and hold the contents of a tank or piping if it leaks or ruptures.

Soil permeability: The quality that enables soil to transmit water or air. Slowly permeable soils have fine-textured materials like clays that permit only slow water movement. Moderately or highly permeable soils have coarse-textured materials like sands that permit rapid water movement.

Spill and overfill protection: Spill protection usually consists of a “spill box” for collecting spills when an aboveground tank is filled. Overfill protection is a warning or prevention of an overfill, such as an automatic shutoff or buzzer. These precautions can prevent a number of small releases over a very long period of time from polluting the groundwater.

Worksheet # 4

Petroleum Product Storage: Assessing Drinking Water Contamination Risk

Existing Underground Storage Tanks (USTs)

Is your underground storage tank registered with the Department of Environmental Protection?

Yes: Continue to answer the questions below.

No: Contact the DEP for help in registering your underground storage tank.

Has your underground storage tank been inspected every year by a certified tank installer or inspector, and has it received a passing inspection report each year?

Yes: Continue to monitor your underground storage tank and continue to have it inspected.

No: Answer the questions below.

Do you wish to remove this underground storage tank?

Yes: Contact the DEP to assure the proper procedures for removing an underground storage tank are followed.

No: Answer the questions below.

Is your underground storage tank in use? Are you currently using the tank?

Yes: Answer the questions below.

No: Contact the DEP to verify that all proper procedures for "out-of-service" underground storage tanks are being followed.

Continued on next page.

Does your underground storage tank and piping have secondary containment with continuous electronic monitoring?

Yes: Maintain your system and report any alarms to the DEP.

No: Contact the DEP to see if changes to your tank and piping are necessary in order to bring the tank into compliance.

If you answered "No" to any of the above questions then contact the DEP at 287 -2651 to request assistance in assuring your underground storage tank facility is brought into compliance with Chapter 691 "Rules for Underground Oil Storage Facilities".

Above-Ground Storage Tanks (ASTs)

Fire Marshall Permit

Do you have a Fire Marshal Permit for your above ground motor fuel storage tank over 60 gallon storage capacity?

Yes: Inspect your tanks and piping to verify that the actual installation agrees with the conditions of the permit.

No: Contact the State Fire Marshal at 626 - 3870 for help in obtaining a permit.

	Low Risk (Rank 4)	Low-Mod Risk (Rank 3)	Mod-High Risk (Rank 2)	High Risk (Rank 1)	Your Rank
Location					
4.1 Position of tank in relation to drinking water well	Tank downslope more than 100 feet from well in soils with low permeability. *	Tank at grade or upslope more than 100 feet from well in soils with low permeability. *	Tank downslope more than 100 feet from well in soils with high permeability. *	Tank at grade or up-slope less than 100 feet from well in soils with high permeability. *	_____

Design and Installation					
4.2 Tank Design	Tank in concrete dike with 110% capacity and equipped with automatic overfill prevention equipment. Double-walled above-ground tanks with all fittings on the top of the tank and with automatic overfill prevention equipment.	Tank in low permeability soil* diked with 110% capacity, manual overfill prevention procedures.	Tank in high permeability soil* diked with 110% capacity, manual overfill prevention procedures.	Tank with no secondary containment or overfill prevention.	_____
4.3 Piping	Double-walled buried piping with continuous electronic interstitial space leak detection and normally closed valve at tank and safety valves at dispenser.	Double-walled buried piping with continuous electronic interstitial space leak detection, but without normally closed valves at the tank and with no safety valves at dispenser.	Single-walled buried piping constructed of cathodically protected steel or fiberglass with normally closed valves at the tank and safety valves at dispenser.	*Bare steel or galvanized single-walled buried piping (illegal since 1995) without normally closed valves at tank and with no safety valves at dispenser.*	_____
Monitoring					
4.4 Tank integrity testing and leak detection monitoring	Daily inventory control, and regular daily inspections of tank and piping. Continuous electronic interstitial space leak detection of double-walled buried piping if applicable.	Regular weekly inspections of tank and piping. Continuous electronic interstitial space leak detection of double-walled buried piping if applicable.	Monthly inspections of tank and piping.	No inventory control, testing or monitoring.	_____

For more information concerning the aboveground storage of flammable or combustible liquids please call the Office of State Fire Marshall at 626 - 3870.

Italicized Type: Besides representing a higher-risk choice, this practice also violates Maine law.
*Low permeability soils, like clay, allow water to flow through slowly. High permeability soils, like sand and gravel, allow much faster water movement.

Farmstead Improvement Action Plan

Here is where you will use the numbers under the "Your Rank" column of the worksheet. Everything that was marked with a 1 or 2 should have an action plan to come up with an alternative low risk practice. There is an example provided in the first row below.

Worksheet Section #	List High Risk and Med-High Risk practice(s)	Alternative Low Risk practice (Include potential sources of technical and financial assistance.)	Action Plan	
			Planned completion date	Indicate date when completed

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I understand that this farmstead assessment (Farm-A-Syst) and corresponding Farmstead Improvement Action Plan were developed on the basis that I have disclosed, to the best of my knowledge, all information pertaining to my farmstead operations.

Farmstead address:

Street _____

City _____ ME, Zip code _____

Watershed name: _____

___ Aerial map with farmstead boundaries is attached

Producer's signature _____

Date ____/____/_____

Farm-A-Syst conducted by:

Name _____

Title _____ Date ____/____/_____