

# Source Water Protection Guide for Non-Municipal Water Supplies

Water Supply Name \_\_\_\_\_ WSSN \_\_\_\_\_  
Water Supply Owner \_\_\_\_\_ County \_\_\_\_\_  
Certified Operator \_\_\_\_\_ Operator ID \_\_\_\_\_  
Well Record Available?  Yes  No \_\_\_\_\_ Date \_\_\_\_\_

## You are a Public Water Supply System!

Source water assessments assigned a susceptibility rating to all public water supply systems. These ratings, designed to assess the potential for contamination of drinking water supplies, range from **low** to **very high**. Although little can be done to improve geologic sensitivity to afford more protection for your well, some actions can be taken to decrease susceptibility (lessen the potential for contamination). This might mean installing a new, deeper or grouted well, properly plugging an unused well, eliminating a potential source of contamination such as a fuel storage tank, a sewer line, or a septic system, or following best management practices. These practices include actions such as properly disposing of used motor oil or following recommended practices for lawn and garden fertilizer application.

## Purpose of this Guide

This guide is designed to help you, the owner of the public water supply, to evaluate the level of risk that existing well conditions or current practices pose to the water supply. This evaluation will give you an indication of the potential risks and suggestions for how to increase water supply protection through best management practices. Answer the risk questions on the worksheets by selecting the statement that best describes conditions at your property. Indicate your risk level (low, medium or high) in the column to the right. Once you have completed all sections, you will list the practices that present medium or high risks to your water supply, and develop a plan to reduce the risks. You are encouraged to work with your certified operator to complete this evaluation of your public water supply.



## Background Information on SWAP

The 1996 amendments to the federal Safe Drinking Water Act required states to develop a Source Water Assessment Program (SWAP). SWAP was designed to identify areas that supply public drinking water, assess the susceptibility of those water supplies to contamination, and inform the public of the results.

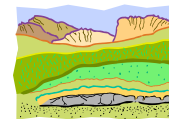
Conducting source water assessments on each well provided a means to broadly characterize sources with respect to the relative risk of contamination. The assessments were intended to assist owners and regulatory agencies in making decisions affecting drinking water systems, future sampling, and groundwater protection efforts. SWAP was completed in 2004 and assessments were sent to all public water supplies.

## Source Water Assessment Structure

The assessment process was structured to evaluate the degree of natural (geologic sensitivity) protection afforded by the permeability of overlying geologic material like sands, gravels, clays, silts, or rock. Other factors evaluated how the location has been affected by human activities. These factors included well attributes such as depth, grouting, age, pumping rate, historic water quality results, and proximity to various sources of potential contamination. Potential contamination sources can include septic systems, sewer lines, fuel storage tanks, groundwater contamination sites, floor drains, hazardous waste storage, fertilizer and pesticide storage and use, and stormwater runoff. These human factors, combined with the geologic sensitivity, determined the overall susceptibility that was reported to each water supplier.

## WELL INTEGRITY AND MANAGEMENT

(Note: Information can be gathered from the Source Water Assessment and/or the Well Record)



	Low Risk Recommended	Medium Risk Potential Hazard	High Risk Potential Unsafe Situation	Your Risk
Permeability of top layer of soil	Clay (very tiny particles).	Silt/loam (midsize particles).	Sand/gravel (large particles).	
Thickness of soil protective layer	10 feet or more of continuous clay.	10 feet or more of clay-sand or clay-silt mix	Less than 10 feet of confining material.	
Total Soil Depth	Deep (Greater than 40 feet).	Moderate (25 to 40 feet).	Shallow (Less than 25 feet).	
Bedrock	Solid, not permeable or fractured.	Solid limestone or sandstone, or fractured granite or shale.	Fractured limestone or sandstone.	
Bedrock and Casing	Bedrock surface is greater than 40 feet below ground surface and/or casing penetrates at least 50 feet into the rock.	Bedrock is less than 40 feet below surface and casing penetrates to at least 50 feet below ground surface.	Bedrock is less than 40 feet below ground surface and casing penetrates less than 50 feet below ground surface.	
Static Water Level	Over 40 feet.	10 to 40 feet.	Less than 10 feet.	
Age of the Well	Constructed after 1994.	Constructed between 1976 and 1994.	Constructed prior to 1976.	
Well Grouting	Drilled and grouted with neat cement or concrete.	Partially or poorly grouted.	Drilled and not grouted or driven point or water jetted.	
Condition of the well casing and cap	No holes or cracks. Approved cap tightly secured. Screened vent.	Unapproved cap tightly secured. Screened vent.	Holes or cracks visible. Cap loose or missing. Water can be heard running into well.	
Protection of well casing	No chemicals are applied near well casing. No downspouts drain on top of well casing. Ground landscaping slopes away from the well casing in all directions.	No chemicals are applied near well casing. Downspouts drain on top of well casing.	Chemicals are applied near well casing. Downspouts drain on top of well casing.	
Depth of the well casing	More than 100 feet, or minimum of 60 feet with 10 feet of clay or 20 feet of clay mixture (confining material).	At least 25 feet, but non confining material.	Less than 25 feet, or no casing (dug wells).	
Casing height above grade	12 inches or more.	From grade level to less than 12 inches.	Below grade, in a pit, or in a basement.	
Surveillance of Wellhead	Wellhead is readily visible for inspection and is protected with barrier from vehicular damage (snowplows, lawn mowers, cars, etc.).	Wellhead is readily visible for inspection but is not protected with barrier from vehicular damage (snowplows, lawn mowers, cars, etc.).	Wellhead is not readily visible for inspection and is not protected with barrier from vehicular damage (snowplows, law mowers, cars, etc.).	
Inspected by a registered well driller or pump installer	Within the past 10 years.	Between 10 and 20 years ago	More than 20 years ago, or don't know when the well was last inspected.	

## WASTEWATER MANAGEMENT (Onsite Disposal)

Wastewater from sinks, toilets, and showers carry dirt, soap, food, grease and bodily wastes out of your buildings. The hazardous chemicals, disease-causing microbes (pathogens) and nutrients such as phosphorus, nitrates and organic wastes found in wastewater can lead to human illness and polluted water. Wastewater must be treated before these contaminants reach groundwater in order to better protect your site's drinking water.



	Low Risk Recommended	Medium Risk Potential Hazard	High Risk Potential Unsafe Situation	Your Risk
Septic System Size	Tank and drain field designed to handle more wastewater than required.	Capacity just meets wastewater requirements.	Design capacity is much less than potential flow of wastewater.	
Age of septic system	Less than 5 years old.	6 to 20 years old.	More than 20 years old.	
Distance that separates the septic tank and drainage field, sanitary sewers and storm drains from water wells	Greater than 200 feet (Type I systems) or greater than 75 feet (Type II systems) from well.	100- 200 feet (Type I systems) or 50-75 feet (Type II systems) from well.	Less than 200 feet (Type I systems) or less than 75 feet (Type II systems) from well.	
The septic tank was last pumped:	Within the past 5 years.	5 to 10 years.	More than 10 years.	
Signs of trouble with the septic system	Drains flow normally, no sewage odors inside or outside, soil over drain field firm and dry and well water tests negative for coliform bacteria.	Drains run slowly or soil over drain field is sometimes wet.	Sewage odors noticed in the facility or near the drain field, drains plugged or back up, soil wet or spongy in drain field areas or well water tests positive for coliform bacteria.	
Records maintained on septic system	Good map and records of system repairs and maintenance are kept.	Some records maintained.	No map or maintenance records kept.	
Cleaners, solvents and other chemicals poured down the drain.	Moderate use of cleaning products discharged with wastewater. Hazardous chemicals never poured down drain or toilet.	Moderate use of cleaning products. Very small amounts of hazardous chemicals poured down drain or toilet.	Heavy use of cleaning products. Hazardous chemicals discharged in wastewater.	
Grease traps	Effective grease traps are in place ahead of septic tanks and the waste is properly disposed.	Effective grease traps are in place ahead of septic tanks and the waste is not properly disposed.	Effective grease traps are not in place ahead of septic tanks and the waste is not properly disposed.	
Chemical or sewage lagoons	Outside the Provisional WHPA and greater than 2000 feet from wellhead (Type I systems) or greater than 800 feet from wellhead (Type II systems).	Outside the Provisional WHPA but less than 2000 feet from wellhead (Type I systems) or less than 800 feet from the wellhead (Type II systems).	Within the Provisional WHPA.	
Feed lots	Outside the Provisional WHPA and greater than 2000 feet from wellhead (Type I systems) or greater than 800 feet from wellhead (Type II systems).	Outside the Provisional WHPA but less than 2000 feet from wellhead (Type I systems) or less than 800 feet from the wellhead (Type II systems)	Within the Provisional WHPA.	
Ownership and/or control of isolation area (200 feet for Type I and 75 feet for Type II Systems).	Own or lease entire area.	Own or lease greater than half of the area.	Own or lease less than half the area.	

## MANAGING HAZARDOUS PRODUCTS

Pesticides and herbicides are hazardous products that pose minimal risks if properly used. However, if they are over-applied or applied too closely to a wellhead, they have greater potential to contaminate your drinking water and nearby surface water (through runoff). Cleaning agents and improperly managed fuel can pollute the water you drink. Fuel stored in large tanks poses a greater risk of contamination than the small quantities stored for power equipment. Though you should pay particular attention to high potential risks from large tanks, you should recognize that fuel stored in any amount increases the risk to your water supply.



	Low Risk Recommended	Medium Risk Potential Hazard	High Risk Potential Unsafe Situation	Your Risk
Pesticides, fertilizers, cleaning agents, and fuel – Storage	No products are stored on site <b>Fuel</b> is not stored on site. Storage on site is more than 2000 feet (Type I systems) or more than 800 feet (Type II systems) from the wellhead and outside the Provisional WHPA.	Products are stored on an impermeable floor with no floor drain. Above-ground fuel stored in secondary containment area or Underground <b>fuel</b> is stored in a double walled tank with cathodic (anti-corrosion) protection and the tank is 200-2000 feet (Type I systems) or 75-800 feet (Type II systems) from the wellhead or further than 800 or 2000 feet away but within the Provisional WHPA.	Products are stored in a room with a floor drain. Aboveground fuel is stored in a tank with no secondary containment. Underground <b>fuel</b> is stored in a tank that is not double walled with cathodic (anti-corrosion) protection, tank type is unknown or tank is less than 200 feet (Type I systems) or 75 feet (Type II systems) from the wellhead.	
Pesticides, fertilizers, cleaning agents and fuel – Use	<b>Pesticides and Fertilizer</b> not applied or applied based on soil tests and objectives. <b>Cleaning Products</b> purchased as needed, or stored in air-tight, leak proof containers. <b>Fuel</b> spills have never occurred.	<b>Fertilizer</b> applied before spring green-up. <b>Pesticide</b> is applied away from wellhead and containers cleaned away from wellhead. <b>Cleaning Products</b> purchased as needed, or stored in air-tight, leak proof containers. <b>Fuel</b> spills are cleaned up if they occur.	<b>Pesticides and Fertilizer</b> are applied over discriminate area and simply based on scheduled applications. <b>Cleaning Products</b> are stored in large stock in improper containers. <b>Fuel</b> spills are not cleaned up if they occur.	
Pesticides, fertilizers, cleaning agents and fuel – Disposal	All products are used completely or removed immediately to a hazardous waste disposal facility.	Waste products are stored on-site and disposed in a landfill away from water wells.	Products are disposed of near a well, in surface water or poured down a drain.	
Fuel Oil for Heating Storage Tanks	In an approved tank located in a basement without a floor drain.	Located outside and above-ground with secondary containment around the tank, valve, and fill pipe, and with a protective covering over the regulator and/or valve.	Located outside, above-ground, and without secondary containment. Or, located under the edge of the roof eave without a protective cover over the regulator and/or valve.	
Generator Fuel Tanks	Tank is located more than 200 feet away (Type I systems) or more than 75 feet away (Type II systems) with secondary containment.	Tank is located more than 200 feet away (Type I systems) or more than 75 feet away (Type II systems) but without secondary containment OR located less than 200 or 75 feet away but WITH secondary containment	Tank is located less than 200 feet away (Type I systems) or less than 75 feet away (Type II systems) and does not have secondary containment.	

## STORM WATER RUNOFF MANAGEMENT

Storm water runoff is water from rain or melting snow that does not soak into the ground. This water collects and transports soil, pet waste, salt, pesticides, fertilizer, oil and grease, yard wastes, litter and other potential pollutants as it flows over the surface of the land. Water from storm drains is not treated by water treatment plants. Polluted storm water degrades Michigan's drinking water, lakes, rivers and wetlands. Groundwater and surface water are interconnected.



	<b>Low Risk Recommended</b>	<b>Medium Risk Potential Hazard</b>	<b>High Risk Potential Unsafe Situation</b>	<b>Your Risk</b>
Car Washing wastes, automotive wastes, and grass clippings, leaves and other yard waste.	None or little waste is produced on site (vehicles taken to a commercial car wash, oil drips and spills cleaned up and kept out of storm water, yard wastes left on lawn or composted).	Some waste is produced on site (vehicles washed on a lawn or gravel drive, oil drips and spills not cleaned up right away, yard wastes piled on site for street collection).	A great deal of waste is produced on site (vehicles washed on driveways, streets or other paved areas, oil, antifreeze and other wastes dumped down the storm sewer, in ditch or on the ground, yard wastes left in paved surface to be carried off by storm water or burned on paved surface or in a ditch).	
Paved surfaces	Paved surfaces minimized. Alternatives such as wood chips or paving blocks used for walkways, patios and other areas. Very small amount of wastes run off site or toward wellhead.	Some small areas paved for patios or basketball promoting some wastes running off from surfaces toward wellhead.	Paved surfaces used extensively and a great amount of wastes run off to surface waters or wellhead.	
Roof drainage	Downspouts and drip lines direct roof drainage onto lawn or garden where water soaks into the ground away from wellhead.	Some downspouts and drip lines discharge water onto paved surfaces or grassy areas where water runs off away from wellhead.	Most or all drip lines or downspouts flow onto paved surfaces. Or downspouts connect directly to storm drains or areas near wellhead.	
Landscaping and buffer strips	Yard landscaped to slow storm water flow and provide areas where water soaks into the ground away from wellhead. Unmowed vegetation buffer strips along streams or lakeshores.	No areas landscaped to encourage water to soak in, but yard is relatively flat and little runoff occurs toward wellhead. Mowed grass or spotty vegetation adjacent to stream or lake.	No landscaping to slow the flow of storm water to wellhead or surface waters, especially on hilly or easily eroded properties.	
Distance from Surface Water	Well is located greater than 200 feet (Type I systems) or greater than 75 feet (Type II systems) from surface water.	Well is located less than 200 feet (Type I systems) or less than 75 feet (Type II systems) from surface water, but has at least 10 feet of protective clay layer.	Well is located less than 200 feet (Type I systems) or less than 75 feet (Type II systems) from surface water, but with no protective clay layer.	



## MANAGING SITE WASTE

The amount, type and location of wastes generated on-site can have an effect on the quality of your drinking water. Composting, storing or dumping up-gradient from your wellhead exposes your groundwater to potential pollutants. Pollutants that run off the dump/compost site directly toward your wellhead can lead to contamination of both groundwater and surface water. Therefore, it is important to be aware of how wastes are stored and disposed on your site.

	Low Risk Recommended	Medium Risk Potential Hazard	High Risk Potential Unsafe Situation	Your Risk
Waste disposal	Only organic wastes (leaves, grass clippings, food, wood chips, etc.) are disposed of on site. Waste (including compost) is stored down-gradient while waiting for removal/use.	Trash and liquids, appliances, tires and other junk are stored on site for eventual removal. Waste (including compost) is stored on site while waiting for removal/use.	Trash and liquids, appliances, tires and other junk are discarded on site. Hazardous and other wastes are improperly discarded to land surface, sewer system, septic system or storm drains. Waste (including compost) is stored up gradient while waiting for removal/use.	
Waste Liquids	Kept in secure containers in an area with secondary containment for proper disposal at an off-site location.	Stored in nonsecure containers and/or in an area without secondary containment for proper off-site disposal.	Improperly disposed of at an on-site location.	
Other Issues				

## ACTION CHECKLISTS

Go back to the assessment charts in this worksheet. For each medium and high risk, write down the improvements you plan to make. Use recommendations from this worksheet and other resources to choose actions you are likely to complete. A target date will keep you on schedule. You don't have to do everything at once, but try to eliminate the most serious risks as soon as you can. Often it helps to tackle the inexpensive actions first.

Write all high and medium risks in this column:	What can you do to reduce the risk?	Target date for action:

Signature of Owner (or Operator if delegated by Owner):

**Please send a copy of this completed form to:**

Mr. Wayne Kukuk  
MDEQ Office Of Drinking Water & Municipal Assistance

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