



Protecting Our Drinking Water Together

An Introduction to Drinking Water Source Protection

DRINKING WATER
SOURCE PROTECTION
ACT FOR CLEAN WATER

Ausable Bayfield
Maitland Valley
Source Protection
Region

Protecting Our Drinking Water Together

An Introduction to Drinking Water Source Protection

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What is drinking water source protection?

To keep your tap water clean and safe to drink, a number of barriers of protection are needed.

Protecting your sources of drinking water is the first step in this multi-barrier approach.

Other barriers include the Three Ts:

- Testing of water
- Treatment of water
- Training of water managers, staff

Still other barriers include:

- Monitoring
- Distribution systems

Drinking water source protection is about further reducing risk to your municipal drinking water sources. The Province of Ontario made this possible through a law called the *Clean Water Act, 2006*.

Your local source protection committee, with community and municipal representatives, has created plans for the Maitland Valley and Ausable Bayfield source protection areas.

The policies in these approved plans manage and address activities near municipal wells that draw water from aquifers underground. These policies are to reduce risk to local water supplies.

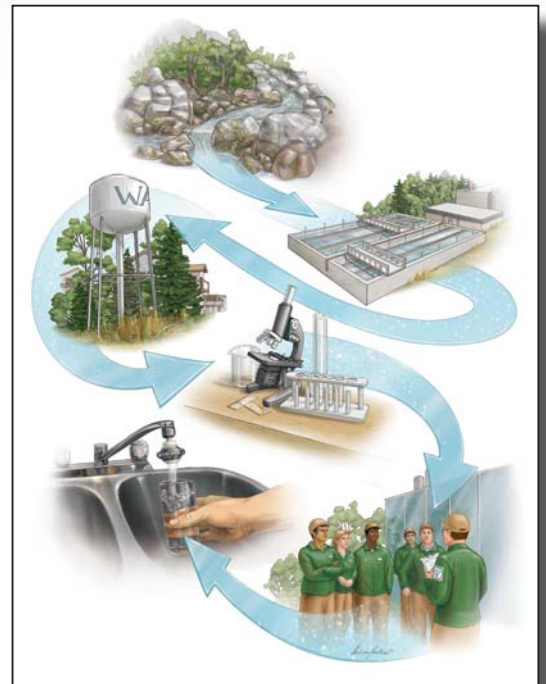
Activities that could pose a threat to water are assessed in one of three categories based on the level of risk:

- Low
- Moderate
- Significant

There are 21 activities that can, in certain circumstances (for example, in certain quantities) pose a significant threat to drinking water in some areas around municipal wells.

Source protection plans reduce risk through policies that use these tools:

- Education and outreach
- Prescribed instruments
- Risk management plans
- Restricted land uses
- Prohibition



The multi-barrier approach includes drinking water source protection as the first barrier of protection.

The purpose of the *Clean Water Act, 2006* is to protect Ontario's existing and future drinking water sources, as part of an overall commitment to safeguard human health and the environment.

A key focus of the law is the preparation of locally developed terms of reference, science-based assessment reports, and source protection plans.

Drinking water source protection plans consist of a range of policies that together, reduce the risks posed by threats to water quality and quantity.

For more information on activities that are threats to drinking water and policies to reduce risk to your water, please continue reading this booklet, or visit sourcewaterinfo.on.ca or ontario.ca, or contact local staff members or your municipal risk management official.

The next page outlines the make-up of the Ausable Bayfield Maitland Valley Source Protection Region.

Where is the Ausable Bayfield Maitland Valley Drinking Water Source Protection Region?

The Maitland Valley and Ausable Bayfield source protection areas are the two watershed areas working in partnership as the Ausable Bayfield Maitland Valley Drinking Water Source Protection Region.

Municipalities in the region draw their water from underground sources (through wells that draw groundwater from aquifers), and surface water (Lake Huron).

The Ausable Bayfield Maitland Valley Source Protection Region includes parts of six counties:

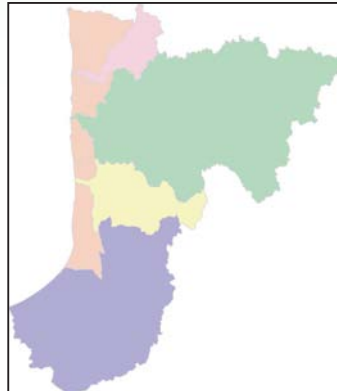
- Wellington
- Perth
- Huron
- Bruce
- Lambton
- Middlesex

There are 24 lower-tier municipalities in the region.

Fifteen of the region's 24 lower-tier municipalities have no activities assessed as significant threats to drinking water.

There are nine municipalities in the region with groundwater wells as their source of municipal drinking water. There are significant threats to drinking water assessed on some properties in these nine municipalities of the region:

- Twp. of Ashfield-Colborne-Wawanosh
- Municipality of Bluewater
- Municipality of Central Huron
- Municipality of Huron East
- Township of Huron-Kinloss
- Town of Minto
- Municipality of Morris-Turnberry
- Township of North Huron
- Municipality of North Perth



Communities with wellhead protection areas in the Ausable Bayfield Maitland Valley Source Protection Region include:

- Atwood
- Auburn
- Belgrave
- Benmiller
- Blyth
- Brucefield
- Brussels
- Clifford
- Clinton
- Dungannon
- Gowanstown
- Harriston
- Listowel
- Lucknow
- Molesworth
- Palmerston
- Seaforth
- Whitechurch
- Wingham
- Zurich

Other wellhead protection areas include:

- Sam, and Vandewetering well supplies near Bayfield
- McClinchey and Kelly well supplies south of Goderich
- Century Heights wells, near Saltford
- Huron Sands well, north of Port Albert

What are some of the ways I can help protect my local sources of municipal drinking water?

Everything that goes into or onto the ground, or into creeks, rivers, and lakes, can impact drinking water.

You can protect water by making sure these things don't end up on the ground, down the sink, or in the toilet:

Paints;
 thinners;
 furniture strippers;
 coolants;
 cleaners;
glues and adhesives;
 gasoline, oil, diesel, or heating fuel;
 degreasers;
 creosote;
 resins; etc.

You can also help in these ways:

- Keep your septic system in proper working order; have your septic system pumped and inspected regularly.
- Test your well water regularly to ensure the water is safe to drink.
- Dispose of hazardous waste properly. Take unused paints, cleaners, pesticides, and medical prescriptions to your local hazardous waste facility.
- Take used engine oil to recycling facilities.



- Protect and maintain your private well. Wells provide pathways for contaminants to enter groundwater. If you have a well, be sure it is sealed properly and if you own a well you no longer use, have it properly decommissioned by a licensed well technician.
- Visit sourcewaterinfo.on.ca and find out other ways to help.
- Talk to staff of the region or your municipal risk management official.

There are more ideas on pages 8 and 9 of this booklet. Wherever you live and work you can help to keep your local sources of drinking water clean and safe.

What are some ways I can help to conserve local water?

- Take your car to commercial car washes designed to prevent pollutant runoff from entering storm sewers. Use commercial car washes that use water efficient sprays, reducing their water consumption.
- Scrape dishes, instead of rinsing them, before loading the dishwasher.
- Only use water-dependant appliances, such as washing machines and dishwashers, when they are full and then choose shorter cycles. Better yet, upgrade to water- and energy efficient models.
- Detect and repair leaks in hoses and sprinklers outdoors.
- Be an avid recycler. Recycle paper products, glass, metals and plastic to

cut down on pollution and also reduces the amount of water we use.

Manufacturing recycled paper uses 58 per cent less water than making paper from virgin wood pulp.

Making glass from recycled materials cuts related air pollution 20 per cent and water pollution 50 per cent.

- Compost organic waste instead of using the garbage disposal. Garbage disposals need running water to operate properly.



What is a vulnerable area?

There are some areas of your region where drinking water sources are more prone to contamination than others.

In order to reduce risk to your drinking water sources, in areas where water is most vulnerable to pollution, an Ontario law identifies four types of vulnerable areas.

The four types of vulnerable areas in the Ontario *Clean Water Act, 2006*:

Significant groundwater recharge area

Highly vulnerable aquifer

Intake protection zone

(for surface-water sources of drinking water such as a Great Lake or large river).

Wellhead protection area

(a zone of protection around a municipal well).

A local source protection committee has created plans to protect municipal drinking water sources in the Maitland Valley and Ausable Bayfield source protection areas.

Plan policies include education and outreach. Websites, videos, open houses, brochures, fact sheets, and this booklet are examples of ways to let you know about the local source protection plans.



Some of those policies are recommendations and in some other cases policies are mandatory.

Policies with must-conform-to legal effect, like risk management plans or prohibition, apply only to people carrying on activities in municipal wellhead protection areas A, B, or C where the land scores high enough for vulnerability and the circumstances (for example, quantities) make an activity a significant threat to drinking water.

Most people are not required to implement policies. Even if local plans do not require you to follow policies, you are encouraged to read the plans for positive actions you can take to protect water in these vulnerable areas.

What do we need to protect our water from?

It is less expensive to protect drinking water through prevention than it is to replace a water supply that has been compromised.

Protection of water at the source can help to prevent these groups of contaminants from reaching your municipal drinking water:

Pathogens

A pathogen is a microscopic organism capable of producing infection or infectious disease in humans. These bacteria or viruses can be dangerous to human health and can be found in human or animal waste. Human pathogens can be found in septic tanks. Manure contains animal pathogens. A pathogen is an organism capable of producing disease. *E. coli O157:H7* is an example of a harmful pathogen.

Chemicals and Compounds

Chemicals can contaminate water.

Chemicals include organic solvents; light non-aqueous phase liquids; dense non-aqueous phase liquids; and hydrocarbons like gas, oil and fuel. Chemical threats include solvents, fuels, fertilizers, pesticides and similar products.

Dense Non-Aqueous Phase Liquids (DNAPLs)

A dense non-aqueous phase liquid (DNAPL) is an organic chemical denser than water.

DNAPLs include some adhesives, cleaning chemicals, paint removers and other liquids. They are often carcinogenic (cancer-causing), and can sink below the water table where they might not be detected by monitoring wells. They are toxic extremely expensive to remove, and almost impossible to remove.

You can help to keep pathogens, chemicals, and chemicals out of our water sources.

What is a wellhead protection area?

A wellhead protection area (WHPA) is one of four main types of vulnerable areas identified in the Ontario *Clean Water Act, 2006*.

It is a zone around a municipal well where planning policies apply in order to manage land-use activities to reduce risk to your community's water.

Wellhead protection areas have four zones:

1)

Zone A

WHPA-A is all the area within 100 metres of the municipal well.

2)

Zone B

WHPA-B is all the area where water and contaminants can reach the well within two years.

3)

Zone C

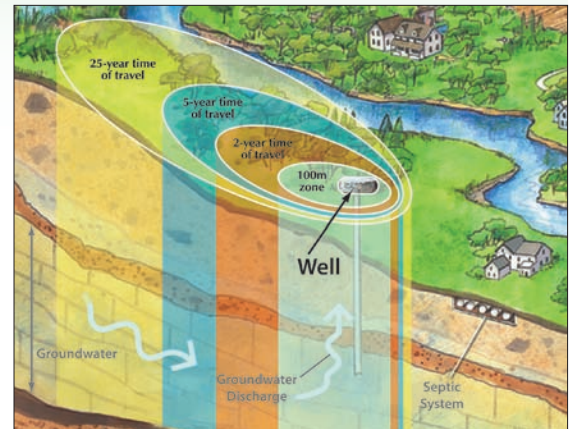
WHPA-C is all the area where water or contaminants can reach the well within five years.

4)

Zone D

WHPA-D is all the area where water or contaminants can reach the well within 25 years.

Source protection planning policies for dense non-aqueous phase liquids (heavier-than-water chemicals) impact wellhead protection areas A, B, and C.



Other policies that require people to act apply to zone A and some parts of zone B.

The amount of land involved in a wellhead protection area is determined by a variety of factors such as the way the land rises or falls, the amount of water being pumped, the type of aquifer, the type of soil surrounding the well, and the direction and speed that groundwater travels.

All of these factors help to determine how long it takes water to move underground to the municipal well itself and how much land around the wellhead needs to be protected.

Wells draw water from underground areas called aquifers where water fills cracks in bedrock or spaces between grains of sand, gravel or dirt. Aquifers are replenished when water from rain and melting snow soaks into the ground. Sometimes, the water also carries pollutants. It can take years, or even decades, for water to reach a well. The speed depends on the characteristics of the soil and bedrock in the area.

Where can activities be significant threats to water sources?

A land-use activity, if not properly managed or addressed, can become a significant threat to drinking water sources when it is taking place in wellhead protection areas:

- In some wellhead protection areas (WHPAs), the most vulnerable areas of your region, such as within 100 metres of a municipal well, or the two-year time-of-travel zone leading to that well where the vulnerability score is 10.

- Dense non-aqueous phase liquids (DNAPLs) are toxic chemicals which can be significant threats to municipal drinking water sources in the five-year time-of-travel zone when stored in quantities of 25 litres or more.

Continue reading this booklet to find out about the 21 activities that can be threats and the circumstances (e.g., quantities) that can make those activities significant threats.

What is an intake protection zone?

Hundreds of thousands of people, in Canada and the United States, get their drinking water from Lake Huron.

Raw water is captured in this region, for treatment, from intakes in Goderich and near Grand Bend (the Lake Huron Primary Water Supply System intake in Port Blake).

The volume of water these Great Lakes intakes draw from creates a low vulnerability score. Therefore no threat activities have been deemed as significant in these zones.

In the Maitland Valley and Ausable Bayfield source protection areas, activities assessed as significant threats to drinking water are only present in some of properties in municipalities where the drinking water systems use groundwater as their source.

Protection of public health is a benefit of drinking water source protection in intake protection zones.

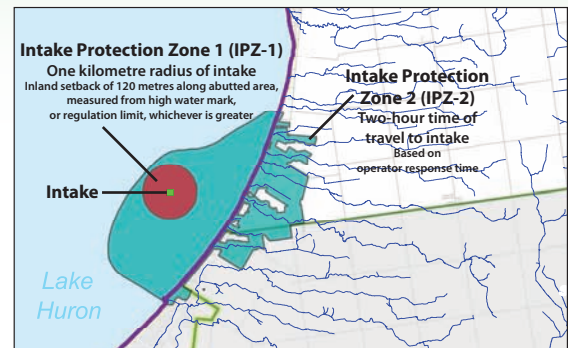
Prevention of drinking water contamination in the first place costs a lot less than cleaning up water after it has been contaminated.

Your local source protection committee has developed source protection plans. The policies in the plans are not mandatory – as threat activities are not assessed as significant – but you are encouraged to consider ways you can help protect your drinking water that has Lake Huron as its source.

Protecting the area around a surface water intake means protecting the surrounding water and, in most cases, the land that surrounds the water.

This area of water and land is known as an intake protection zone, or IPZ. The Province of Ontario has required that several intake protection zones be identified:

- 1) For the area immediately adjacent to the intake
- 2) For the area further upstream where a spill might reach the intake before the plant operator can deal with it
- 3) An area that includes a larger part of the source protection area



This illustration shows an intake protection zone on Lake Huron. See pages 4, 8, and 9 for ways to protect water.

Intake protection zones may include properties around the lake or on smaller feeder rivers or tributaries.

Here are some benefits to keeping contaminants out of Great Lakes water sources:

- Protecting human health – keeping pathogens and chemicals out of drinking water sources, to prevent illness or death
- Not having to find new drinking water sources when old ones become contaminated
- Avoiding the need or cost to clean up contaminated water
- Reducing the cost of water treatment
- Ensuring a long-term supply of clean water
- Ensuring a reliable water supply and positive climate for economic growth

The area of water and land in an intake protection zone is determined, under the Ontario *Clean Water Act, 2006*, by factors such as the time it would take any material spilled in, or near, the river or lake, to reach the water intake. This is called the time of travel. For the purposes of establishing the second intake protection zone, technical staff examine a minimum time of travel of two hours, although it could be longer if the water treatment plant operator response time is longer.

Visit sourcewaterinfo.on.ca for copies of your local source protection plans with ways you can help to protect drinking water sources.

What is a highly vulnerable aquifer?

When a municipality draws drinking water from a well, it is getting that water from underground. This groundwater is found in aquifers.

A highly vulnerable aquifer (HVA) is one of four types of vulnerable areas identified in the Ontario *Clean Water Act, 2006*.

Aquifers are areas of soil or rock under the ground where cracks and spaces allow water to pool. They are considered highly vulnerable based on factors such as how deep it is underground, what sort of soil or rock is covering it, and the characteristics of the soil or rock surrounding it.

For example, a thin layer of permeable soil, such as sand or gravel, over an aquifer, would make that aquifer particularly vulnerable.

Policies in local source protection plans, that apply to highly vulnerable aquifers, rely on education and outreach to reduce risk to drinking water sources.

The policies in those areas are only recommendations as they do not have legal effect that requires property



This photo shows a local sinkhole. This is an example of an area where surface water, and contaminants, could reach groundwater sources. That's why it's important you take actions to reduce risk to the water underground.

owners to comply. However, municipalities, implementing bodies, and local people should have regard for these policies.

We thank you for all you do to reduce risk to your community's drinking water sources.

How can I help protect water in local HVAs?

- Take care when refueling gas tanks for cars, lawn mowers, chainsaws, weed trimmers, or other machinery to avoid spilling fuel on the ground.
- Check the labels on products in your home. If a product is flammable or corrosive or hazardous, it may contain chemicals that could contaminate a drinking water source. You need to properly dispose of it.
- Use containment containers, drop cloths or tarps when working with hazardous materials such as paints, driveway sealers or wood stain to prevent spills from leaking into the ground. If a spill occurs, clean it up with an absorbent material such as kitty litter or sawdust and scoop the contaminant into a container.
- Protect and enhance the vegetation along the banks of ponds, streams and lakes to help control erosion.
- Use a broom to clean your driveway – not your garden hose.
- Clean up pet waste which contains pathogens that can run into storm sewers during a rain storm.
- Prevent pollutants from entering into runoff by reducing or eliminating the use of pesticides, fertilizers, sidewalk salts and by not over-watering your lawn.

For more ideas on how to protect drinking water see the strategies on the bottom of the next page or review some of the ideas on Page 4 of this booklet.

Fuel and chemicals, including organic solvents and light and dense liquids, and pathogens, such as *E. coli O157:H7* bacteria, can cause illness and even death if they reach a source of drinking water.

That's why we need your help to keep contaminants out of the water in Lake Huron and our local wells.

What is a significant groundwater recharge area?

The land area where the rain or snow seeps down into an aquifer is called a recharge area.

An aquifer is an area of soil or rock under the ground that has many cracks and spaces and has the ability to store water. Water that seeps into an aquifer is called recharge. Much of the natural recharge of an aquifer comes from rain and melting snow.

Recharge areas often have loose or permeable soil, such as sand or gravel, which allows the water to seep easily into the ground. Areas with shallow fractured bedrock are also often recharge areas.

A recharge area is considered significant when it helps maintain the water level in an aquifer that supplies a community with drinking water.

A significant groundwater recharge area (SGRA) is one of four types of vulnerable areas identified in the Ontario *Clean Water Act, 2006*.

Policies in local source protection plans, for the Maitland Valley and Ausable Bayfield source protection areas, that apply to significant groundwater recharge areas, rely on education and outreach to reduce risk to drinking water sources.

The policies in those areas are recommendations only as they do not have legal effect that requires property owners to comply. However, municipalities, implementing bodies, and people in the region should have regard for these policies.

We can all play a role in keeping drinking water sources safe.

How can I help to protect drinking water in SGRAs?

Studies have shown it costs much less to protect water than it does to clean it up.

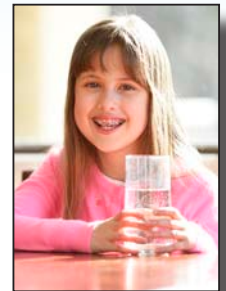
You may find lots of ideas on how to protect drinking water sources at the bottom of the previous page.

Many of the strategies for protecting water in highly vulnerable aquifers also apply in significant groundwater recharge areas (SGRAs).

Here are some more ideas:

- Use non-toxic products for cleaning and environmentally-friendly soaps, shampoos and personal care products. What you use in your house goes back down your drain.
- Take care when changing engine oil. One litre of gas or oil can contaminate a million litres of groundwater, it is said.
- Use efficient showerheads, taps and toilets. If you don't have a low-flow toilet, reduce your water use by placing a weighted plastic bottle with water in the water tank of your toilet. Low-cost inserts for the toilet tank are an alternative to plastic bottles. With a toilet insert, a family of four could save 45,000 litres of water per year. Toilet inserts are available at hardware and plumbing supply stores.

- Plant native ground cover, plants and grasses that are heat and drought resistant, require less water and care, and are less expensive to maintain.
- Detect and repair leaks in the pipes, toilets, and taps around your home.



- If you are a lakeshore resident or rural non-farm resident there are stewardship guides that can help you reduce your impact on the environment and protect water. There are also best practices and plans for businesses and farms. Contact your local conservation authority.
- Use rain barrels to catch water from your eavestrough downspout.
- Keep a jug of cold water in the fridge instead of running the tap until the water turns cold.

You are also invited to review and put into action the ideas in Page 4 of this booklet.

Protection of water at the source adds protection and reduces risk to human health. Thanks for doing what you can.

What is time of travel?

The amount of land in a municipal wellhead protection area is determined by a variety of factors such as:

- The way the land rises or falls
- The amount of water being pumped
- The type of aquifer
- The type of soil surrounding the well
- The direction and speed that groundwater travels.

All of these factors help to determine how long it takes water to move underground to the well and how much land around the wellhead needs protection.

What is time of travel?

Time of travel is an estimate of the time required for a particle of water to move in the saturated zone from a specific point in an aquifer into the municipal well or intake.

It is:

(a) In respect of groundwater, the length of time that is required for groundwater to travel a specified horizontal distance in the saturated zone, and;

(b) In respect of surface water, the length of time that is required for surface water to travel a specified distance within a surface water body.

What is a transport pathway?

Transport pathways are features present at the surface that provide a direct pathway to surface water or disturb the surface above the aquifer and artificially enhance flow to sources of groundwater stored in aquifers.

Transport pathways increase the risk of contamination to surface and subsurface drinking water sources by by-passing the natural protection that soils and overburden create, and thereby resulting in greater potential risk of contamination from nearby threats and increasing the overall vulnerability of the raw water supply.

For instance, if a chemical spill occurs at surface, these pathways provide a direct link to potential contamination of the raw water supply.

Common examples of transport pathways that increase the risk of contamination to surface water sources include:

- Drainage ditches
- Sewer lines
- Storm sewers
- Tile drains

Common examples of transport pathways for groundwater sources include:

- Wells – improperly maintained or constructed or abandoned wells
- Aggregate pits

- Deep excavations such as trenching for sewer lines
- Boreholes

The Ontario *Clean Water Act, 2006* regulations define transport pathways as “a condition of land resulting from human activity that increases the vulnerability of a raw water supply of a drinking water system.”

The presence of a transport pathway can increase the vulnerability score of an area.

Although, not identified as one of the 21 prescribed drinking water threats, Section 27 of *Ontario Regulation 287/07* allows source protection committees to develop optional policies that are intended to ensure that the transport pathway ceases to endanger drinking water supplies. These types of policies may establish stewardship programs, specify and promote best management practices, establish pilot projects, govern research, or specify actions.

Given that only these non-regulatory tools are available for transport pathway policies, and the fact that they would be non-legally binding, the Ausable Bayfield Maitland Valley Source Protection Committee chose not to write a transport pathway policy.

For more information review the Explanatory Document available online at sourcewaterinfo.on.ca.



What are activities that can pose threats to drinking water sources?

A drinking water threat is an activity (such as storing heating oil at your home or having a septic system) or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water. (Sources of drinking water in the Ausable Bayfield Maitland Valley Source Protection Region include surface-water from Lake Huron and groundwater – water that is underground in aquifers and that is drawn up through municipal wells).

Here are the 21 activities which could threaten municipal drinking water sources in certain areas and circumstances (for example, in certain quantities):

Prescribed Drinking Water Threats:

1. The establishment, operation or maintenance of a waste disposal site
2. The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage (This includes septic systems)
3. The application of agricultural source material to land
4. The storage of agricultural source material
5. The management of agricultural source material
6. The application of non-agricultural source material to land
7. The handling and storage of non-agricultural source material
8. The application of commercial fertilizer to land
9. The handling and storage of commercial fertilizer
10. The application of pesticide to land
11. The handling and storage of pesticide
12. The application of road salt
13. The handling and storage of road salt
14. The storage of snow
15. The handling and storage of fuel
16. The handling and storage of a dense non-aqueous phase liquid (DNAPL)
17. The handling and storage of an organic solvent
18. The management of runoff that contains chemicals used in the de-icing of aircraft
19. An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body
20. An activity that reduces the recharge of an aquifer
21. The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard

What is a dense non-aqueous phase liquid?

Dense non-aqueous phase liquids are heavier (denser) than water and, in the event of a spill, sink into the ground.

Even small amounts can harm your health and your drinking water sources.

These substances are difficult and expensive to remove. It is very important we prevent dense non-aqueous phase liquids (DNAPLs) from ever reaching our water sources.

These toxic chemicals can be found in homes, businesses, farms, landfills, municipal and other properties.

These heavier-than-water liquids include some adhesives, cleaning chemicals, paint removers, and other liquids.

These chemical threats have been used in the production of drugs, in dry cleaning, in metal degreasing, in the creation of pesticides, paint stripping, in manufacturing of cars, steels and aircraft and the manufacturing of electronics – and through other means.

The “handling and storage of a dense non-aqueous phase liquid” is one of 21 drinking water threat activity categories under the General Regulation of the Ontario *Clean Water Act, 2006*. Handling and storage of the following types of DNAPLs is restricted, and in some cases prohibited, in certain wellhead protection areas:

- Dioxane-1,4
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Tetrachloroethylene (PCE)
- Trichloroethylene
- Vinyl chloride

How will this affect me?

Some businesses and industries that use these chemicals, in wellhead protection areas, may be required to complete a risk management plan.



It is vital to stop using, or to properly store, toxic chemicals – especially dense non-aqueous phase liquids. Help keep chemicals out of water sources.

Your municipal risk management official (RMO) will work with you to identify ways to lessen the risk of a spill or leak.

New uses of these chemicals is prohibited in some zones of high vulnerability around municipal wells.

Since DNAPLs are found in many household products, all landowners are encouraged to consider the following ways keep these chemicals out of our water:

- Dispose of hazardous wastes properly: Take batteries, paint and other hazardous waste from your home or property to your municipal hazardous waste site or waste disposal days.
- Find the least toxic product and only buy what you need to do the job.
- Talk to your local store or supplier. Ask for alternatives without harmful chemicals.

DNAPLs aren't the only threats. Other chemicals that may require a risk management plan include organic solvents, fuel, pesticides, and herbicides.

Chemicals can threaten both groundwater and surface water sources and human health. That's why it is so important for you to properly store and dispose of these chemicals, and to find alternatives.

What are the commonly used DNAPLs?

DCM (dichloromethane)	Paint stripper, metal cleaning, pharmaceuticals, aerosols.
TCM (chloroform)	Pharmaceuticals, fats, oils, rubber, resins.
TCA (trichloroethane)	Metal/plastic cleaning, adhesives, aerosols, inks, fats, waxes.
CTC (carbontetrachloride)	Fats, oils, laquers, varnishes, waxes, resins, seed oil.
TCE (trichloroethylene)	Metal cleaning, dry cleaning, paint removers, adhesives.
PCE (perchloroethylene)	Dry cleaning, metal cleaning, intermediates in processes.

The handling and storage of a dense non-aqueous phase liquid.

Threat Subcategory: Handling Of A Dense Non Aqueous Phase Liquid (DNAPL)

Ref #	Circumstances	Chemical
102	1. The below grade handling of a DNAPL in relation to its storage.	Dioxane-1,4
103		one or more Polycyclic Aromatic Hydrocarbons (PAHs)
104		Tetrachloroethylene (PCE)
105		Trichloroethylene or another DNAPL that could degrade to Trichloroethylene
106		Vinyl chloride or another DNAPL that could degrade to vinyl chloride
107	1. The above grade handling of a DNAPL in relation to its storage.	Dioxane-1,4
108		one or more Polycyclic Aromatic Hydrocarbons (PAHs)
109		Tetrachloroethylene (PCE)
110		Trichloroethylene or another DNAPL that could degrade to Trichloroethylene
111		Vinyl chloride or another DNAPL that could degrade to vinyl chloride

The provincial Tables of Threats and Circumstances are available online at ontario.ca. There are 21 activities (such as storing home heating oil or having a septic system) that can be threats to municipal sources of drinking water. Assessment Reports list these threats as significant, moderate, or low threats, depending upon where they are located and circumstances such as quantity.

What are some circumstances where an activity may be considered a significant threat to drinking water sources?

A land-use activity could be a significant threat to drinking water if:

- It is located near a municipal well – for instance,
 - 1) Within 100 metres of that well, or;
 - 2) Within the two-year time-of-travel area leading to that municipal well.
- The activity has not been prohibited
- The activity is not properly managed
- The activity is taking place in certain circumstances.

What is a circumstance that makes a threat significant?

Quantity and location are examples of circumstances that make an activity a significant threat to drinking water.

For example, if you are located within

100 metres of a municipal well, and you have home heating oil stored at your house, circumstances that would make it a significant threat are that the fuel is stored below grade (in your basement, for example) and the volume is greater than 250 litres.

One way to find out if your activity is a significant threat to drinking water is to contact staff in your region or your municipal risk management official.

You can also check maps online at sourcewaterinfo.on.ca to find out if you are in a wellhead protection area A, B, or C.

You may look to see if the activity is one of the 21 threats at ontario.ca. You can find out what circumstances make that threat significant online here:

<https://www.ontario.ca/environment-and-energy/provincial-tables-circumstances>

What are Provincial Tables of Threats and Circumstances?

The Ontario Ministry of the Environment and Climate Change has made tables that show when an activity or condition can be a significant, moderate or low threat to drinking water.

The tables show levels of risk posed by hundreds of combinations of threats, vulnerability scores, and circumstances (such as quantities) under *Ontario Regulation 287/07*.

For full tables visit ontario.ca.

Hazard ratings were calculated from a database from such components as:

- The toxicity, environmental fate, quantity, and method of release for chemical parameters, and;
- The frequency of presence of pathogens, and the method of release for pathogens.

What is a source protection committee?

When the Honourable Dennis R. O'Connor completed the Inquiry into the water-related tragedy in Walkerton, Ontario in 2000, his report said that "the best way to achieve a healthy public water supply is to put in place multiple barriers that keep water contaminants from reaching people."

The Province of Ontario has implemented the recommendations of the Inquiry adding several barriers of protection to drinking water, including the first barrier: protection of drinking water sources.

The Ontario *Clean Water Act, 2006* was one of the laws created to protect municipal sources of drinking water.

The legislation created 19 local source protection committees throughout the province.

These local committees included representatives for different walks of life, including economic sectors, municipalities, and the public.

Source protection committees have completed three major pieces of work to protect municipal drinking water sources:

- Terms of Reference
- Assessment Reports
- Source Protection Plans

Who sits on our local source protection committee?

The Ausable Bayfield Maitland Valley Drinking Water Source Protection Committee (SPC) was formed in 2007.

It was Ontario's first such committee.

This local committee is made up of 15 voting members plus the Chairperson and non-voting liaison members.

The voting members from your community represent:

- Municipalities – Five members
 - Northern
 - Southern
 - Eastern
 - Western
 - Central
- Agriculture – Three members
- Environment – Two members
- Industry – One member
- Commerce – One member
- Public-at-large – Maitland Valley – One member
- Public-at-large – Ausable Bayfield – One member
- Property and landowner associations including seasonal and shoreline residents – One member

There are also non-voting liaisons from:

- Ontario Ministry of the Environment and Climate Change
- Maitland Valley Source Protection Authority
- Ausable Bayfield Source Protection Authority
- Public health

People are welcome to observe the meetings of the source protection committee.

Meeting dates are posted online on the local website at sourcewaterinfo.on.ca. You are also welcome to subscribe to an electronic newsletter there with updates on drinking water source protection news.

Your local source protection committee has created source protection planning policies that are both practical and effective.

The Province of Ontario approved the plans for the Maitland Valley and Ausable Bayfield source protection areas in 2015. Municipal risk management officials and source protection region staff are working with people in the region to implement the policies and protect water.

What do local assessment reports tell us?

Assessment of threats to drinking water has been done for the Maitland Valley and Ausable Bayfield source protection areas. This information is available in the provincially approved assessment reports. They are available online at this website: sourcewaterinfo.on.ca.

Assessment reports identify vulnerable areas, issues, and those land use activities or conditions which can, in certain circumstances, pose significant threats to municipal drinking water sources, as defined by the Ontario *Clean Water Act, 2006*.

In the case of drinking water source protection, a threat refers to any one of 21 activities or conditions which can, if not properly managed, pose risk, in certain circumstances, to drinking water sources.

Examples of threats include sewage (such as septic systems), fuel storage (such as home heating oil), or other handling or storage of substances containing pathogens (such as *E. coli O157:H7* bacteria) or chemicals (including organic solvents and dense non-aqueous

phase liquids or DNAPLs).

The reference to threats does not mean there's an immediate threat to drinking water on a landowner's property. These are activities or conditions which could, if not properly managed or addressed, pose a threat to drinking water sources.

The reports also identify each watershed within the source protection area, characterize quality and quantity of water, set out water budgets, describe groundwater and surface water flow, quantify water takings, identify significant groundwater recharge areas and highly vulnerable aquifers, and identify surface water intake protection zones and wellhead protection areas where contaminants on the surface have the potential to reach municipal water supplies, if not properly managed.

For more information on how the terms assessment reports and source protection plans were developed, visit the Ontario Ministry of the Environment and Climate Change's website at: ontario.ca

What is a drinking water source protection plan?

Policies in your approved source protection plans will reduce risk to local municipal drinking water sources in the Maitland Valley and Ausable Bayfield source protection areas.

The new plans are to reduce this risk through a practical and local approach to manage threats in the most vulnerable areas of the source protection region.

Community representatives on the source protection committee have worked with the public for more than seven years to prepare terms of reference, assessment reports, and source protection plans.

The plan policies with must-conform-to legal effect apply, in this region, only in three zones around municipal wells:

- 1) 100-metre wellhead protection area
- 2) Parts of two-year time-of-travel area
- 3) In the case of dense non-aqueous phase liquids, within the five-year time-of-travel area.

Direct education to persons engaged in an activity (for example, someone with a septic system or home heating oil near a municipal well) is part of the local threats management approach.

Policies such as prohibition, or risk management plans, would only apply to significant threat activities. Those threats can only be found in the three most vulnerable wellhead protection areas of the region (zones A, B, and C).

If the threat exists today a risk management plan will usually be required. (Risk management plans do not apply to septic systems, however).

In general, if a significant threat does not exist today it cannot be established in the future.

For copies of the plans, visit the local website at sourcewaterinfo.on.ca or visit the Maitland Valley or Ausable Bayfield source protection authority offices during business hours.

What is involved in septic system inspection?

Septic systems in good working condition help reduce the risk of drinking water contamination, both to your water supply and your neighbour's.

This is important, especially if your septic system is in a wellhead protection area.

If you have a septic system, and your property is within 100 metres of a municipal well, or you are in the two-year time-of-travel area, your septic system may be assessed as a significant threat to municipal drinking water sources. If so, your septic will need to be inspected beginning in spring of 2015.

What does a septic inspection entail?

It is up to each municipality to determine how they will conduct their inspections.

Contact your local municipality (or health unit if they have been contracted by your municipality) for full details.

Is there a fee?

It is up to each municipality how they recover their costs from the landowner. Talk to your municipality or health unit to learn if there is a cost for your septic inspection.

What happens after my inspection?



Septic systems – including leaching beds – need to be designed properly to protect water and need to be maintained properly and inspected.

All septic systems subject to mandatory inspections will be re-inspected at least every five years.

If the system is failing, what do I do?

Contact a qualified installer for repair or replacement of the system.

If the septic is a tertiary system that gets inspected annually does it still require the mandatory inspection?

A treatment unit is serviced and tested yearly as per maintenance agreements. Mandatory inspection is still required for the entire septic system including the leaching bed.

How can I reduce risk to water posed by my septic system?

- Keep your septic system in proper working order and empty the tank regularly.
- Do not apply manure or fertilizers over the leaching bed or near it.
- Do not pour paint, grease, pesticides, solvents, thinners, nail polish remover, kerosene, antifreeze, gas, diesel, oil or any other harmful product down drains or into toilets. They can seep into groundwater and also reach surface waters.
- Chemicals down your drain may prevent your septic system from working properly.
- Avoid using disinfectants like bleach, caustic toilet bowl cleaners, and drain cleaners, which kill beneficial bacteria in your tank and may cause sewage to pass through the system without treatment.
- Plant only grass over and near your leaching bed to aid in evaporation and to prevent erosion.
- Have your septic system inspected.
- Don't allow trees or shrubs to grow too close to the leaching bed or tank as their roots can clog or damage your system.
- Look for liquid detergents or concentrated detergents that don't contain phosphates. Phosphates can harm local water quality.
- Keep household items, such as dental floss, feminine hygiene products, condoms, diapers, food solids, hair, washing machine lint and cat litter out of your system. These can clog your leaching bed and pipes.
- Keep vehicles and livestock off your leaching bed and away from your septic tank. Excessive weight can damage the pipes and tank, and your system may not drain properly under compacted soil.
- Check with your local health unit or health department before using septic tank additives.

When does septic system require inspection?

Changes have been made to the *Ontario Building Code* through *Ontario Regulation 315/10*. These changes require mandatory “on-site sewage system” (septic system) inspections. These amendments support the *Ontario Clean Water Act, 2006*.

The *Clean Water Act* identifies sewage storage, including septic systems, as one of 21 activities that can pose a significant threat to drinking water. The *Ontario Building Code* was amended in response.

The *Ontario Building Code* requires septic inspection programs to identify systems that aren’t being properly maintained, and that therefore pose a threat to public health.

Why focus on septic systems?

Septic systems, when properly designed, constructed and maintained, effectively reduce or eliminate most human health or environmental threats posed by pollutants in household wastewater. However, septic systems do require regular maintenance and they can fail.

Failed systems pose a serious public health risk and can contaminate the surrounding ground and water, and enter drinking water systems far beyond the property boundaries. There is significant potential to cause serious illness and even death.



Regular septic pumpouts, proper maintenance, and inspections help to ensure your septic system is working well.

The first phase of septic inspections begins in this region in the spring of 2015. Talk to your municipality or health unit about having your septic system inspected. Municipalities may choose to have members of their building inspection staff do them or they may contract the health unit.

What information do I need?

You should know what type of system(s) you have, the age of the system if possible, know the location of the system, and have any inspection reports from pump-outs, and any actions taken to remediate failed systems.

Local bodies who will inspect septic systems

Municipalities in the Ausable Bayfield Maitland Valley Source Protection Region where septic systems may be assessed as a significant drinking water threat *	Municipality, health unit, or other authority conducting inspections	Start date (Anticipated)
Township of Huron-Kinloss	Municipality	Underway
Township of Ashfield-Colborne-Wawanosh	Huron County Health Unit	Spring 2015
Municipality of Bluewater	Municipality	Spring 2015
Municipality of Central Huron	Huron County Health Unit	Spring 2015
Municipality of Huron East	Huron County Health Unit	Spring 2015
Municipality of Morris-Turnberry	Municipality	Spring 2015
Township of North Huron *	Huron County Health Unit	Spring 2015
Municipality of North Perth	Municipality	Spring 2015
Town of Minto *	Municipality	Spring 2015

* **NOTE:** In some cases, such as within the Town of Minto and the Township of North Huron, there are currently no septic systems in the region assessed as significant threats to drinking water.

What is a prescribed instrument?

One way to regulate an activity, in order to protect public health, is to use a prescribed instrument.

Under the *Clean Water Act, 2006* in Ontario, an instrument is any document of legal effect, including a permit, licence, approval, authorization, direction or order created under Ontario legislation.

When an instrument is provincially “prescribed,” it is specified in a regulation. Instruments, in this case, are documents that manage; approve or prohibit; permit; licence; or direct, order, or authorize activities to be completed or to be stopped.

A provincially prescribed instrument is one of the tools that can help to reduce threats to your drinking water.

Here are some examples of provincially prescribed instruments:

- Environmental Compliance Approvals (formerly Certificates of Approval)
- Pesticide Permits
- Permits to Take Water
- Nutrient Management Strategies
- Nutrient Management Plans
- Aggregate licences
- Renewable Energy Approvals
- Approvals of municipal official plans
- Orders to clean up soil or groundwater contamination
- Sewage and waste
- Municipal Drinking Water Licence
- Drinking Water Works Permit
- Aggregate Resources Act Instruments

Here are some examples of laws with regulations prescribing instruments:

- Pesticides Act
- Nutrient Management Act, 2002
- Aggregate Resources Act
- Oil, Gas and Salt Resources Act
- Mining Act
- Environmental Protection Act
- Conservation Authorities Act
- Crown Forest Sustainability Act, 1994
- Ontario Water Resources Act

Some instruments may be used by municipalities or federal governments, as well. For example:

- Municipal government – e.g., business licences, building permits
- Federal government – e.g., authorization to establish/operate a nuclear facility, authorization for works or undertakings affecting fish habitat, licence/permit for storage/transportation of explosives

Instruments may be prescribed for the purposes of the *Clean Water Act*, which means that they can be used to implement policies in a source protection plan and manage threats to sources of municipal drinking water.

Many threats to drinking water sources are already regulated through provincial instruments. There are many instruments established in legislation but only a limited number of instruments are prescribed to the *Clean Water Act* for implementation of policies in source protection plans.

It is common for site-specific instruments to include additional terms and conditions that establish requirements not listed in the legislation. For example, Environmental Compliance Approval for waste disposal sites (landfill sites) often require monitoring of groundwater and/or surface water quality at specified locations around the landfill site. This type of requirement is not stipulated in the broader legislation; instead these types of requirements are left to be addressed by the site-specific instrument. This allows the monitoring program to be customized to fit the needs of the particular landfill site.

For more information, visit ontario.ca for regulations and prescribed instruments overview bulletin.

You may also be interested in your local source protection committee’s Explanatory Document explaining when and why prescribed instruments were used to address threats to drinking water sources. This document is available online at sourcewaterinfo.on.ca.

How can we reduce risk to water sources from handling and storage of fuel – such as home heating oil?

Do you have heating oil at your home or property?

Do you store large amounts of gas or diesel?

If you are located in a wellhead protection area, your fuel storage may have the potential to contaminate the municipal drinking water source (the municipal well) if not properly managed.

The illustration at the bottom of this page will give you an idea if your fuel storage is assessed as an activity that poses a significant threat to drinking water sources.

You may also want to speak with staff in the region or with your municipal risk management official.

How will I be affected ... ?

You may be required to:

- Complete a risk management plan (RMP).

If so, this plan is:

- Negotiated between you and your municipal risk management official.
- An RMP is not required if propane or natural gas are used for heating.
- If you are considering switching to another fuel source/ heating system, discuss your plans with your municipal risk management official (RMO).



- Contact your insurance provider if you are planning to replace your fuel tank. They may have additional requirements.

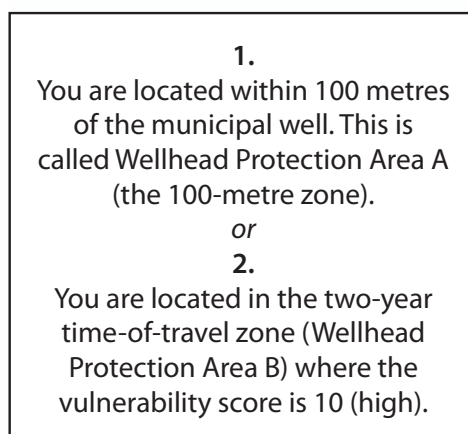
As someone using home heating oil or storing large amounts of fuel:

- You have a legal responsibility to properly maintain your tank.
- You are legally required to clean up and report any leaks or spills.
- You must have your tank inspected by a licensed technician as legally required under Technical Standards and Safety Authority (TSSA) and Canadian Standards Association (CSA) code. Visit TSSA and COHA websites for more information.
- Fuel tanks must be inspected on a regular basis so that potential problems can be discovered and corrected. This will help prevent leaks or spills and protect your community's water.

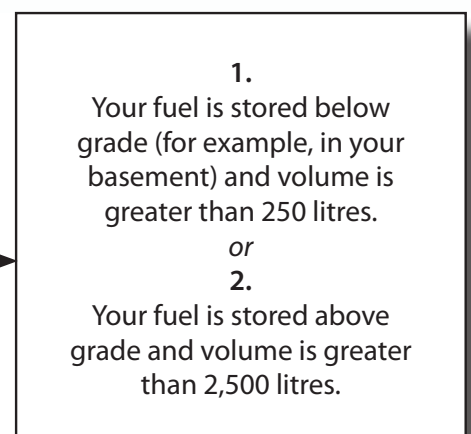
How can I help?

- Replace old tanks with double-walled tanks
- Install drip trays below tanks and burners
- Install alarm systems for leak detection
- Install overfill protection devices
- If tanks are outside, install bollards and overhead protection to protect it from damage
- Create a spills action plan – what to do in case of a spill

Your fuel storage is a significant threat to drinking water and requires risk management plan in this circumstance:



and





Effective management of fertilizer storage and application can reduce risk to local water sources.

How can we reduce risk to water posed by fertilizers?

The storage and application of fertilizer can create a threat to municipal sources of drinking water.

Application of fertilizer

If the land you operate is located in the Dungannon, Lucknow, or Huron Sands wellhead protection area you may need a risk management plan when applying fertilizer.

The following items may be part of a risk management plan (RMP):

- Nutrient Management Strategies or Plans – If you have one, make sure you inform your municipal risk management official (RMO). The nutrient management strategies and plans will be reviewed to see if they offer adequate protection.
- Precision agriculture soil sampling and/or variable rate spreaders – Mapping from soil sampling can be used to indicate nutrient requirements across the field, and variable rate spreaders may be programmed to apply the recommended rate of fertilizer to each specific block across the field.
- The 4R concept – The right fertilizer source, at the right rate, at the right time, with the right placement.
- Controlled-release or slow-release fertilizers release nutrient contents at more gradual rates that permit maximum uptake and utilization of the nutrient while minimizing losses due to leaching.

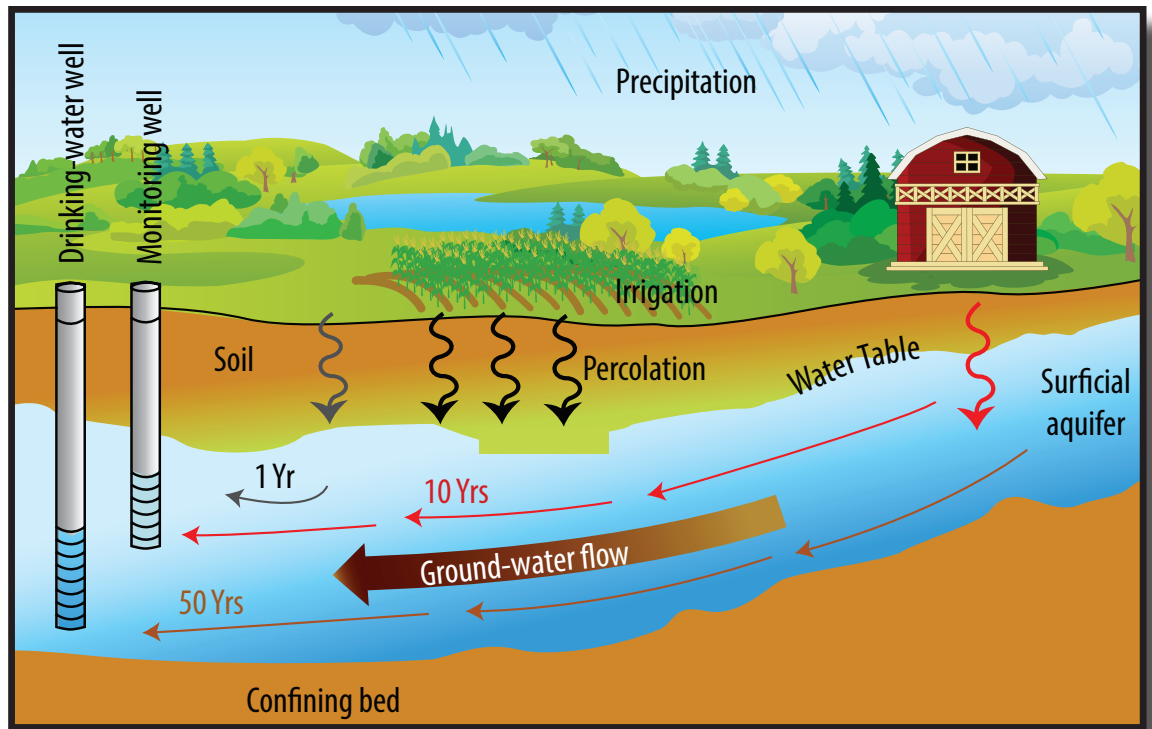
- Precision fertilizer technologies – involve a variety of strategies including satellite imagery, aerial photography, and ground-based sensors to target the application of fertilizers.
- Calibrated spreading equipment – ensure accurate application rates.
- Minimum recommended setback distances to surface water

Storage of Fertilizer

If you store more than 2,500 kg of commercial fertilizer in a vulnerable area in the wellhead protection area it will require a risk management plan. The following items may be part of a risk management plan:

- Needs Assessment – purchasing only that which is required to grow the current, immediate crops, and as close to the time of use as possible will reduce the risk of contamination.
- Design considerations for storage – so spills or leaks are contained and do not to contaminate ground or surface water.
- Relocation of fertilizer mixing/loading zones away from wellhead protection areas where the vulnerability is high.

After April 1st, 2015 no NEW storage of commercial fertilizers, of more than 2,500 kilograms, will be allowed in the most vulnerable areas around municipal wells.



This diagram shows potential for pesticides to contaminate groundwater.

How can we reduce risk to water posed by pesticides?

The storage and application of pesticides can pose a threat to municipal sources of drinking water.

Application of Pesticide

If the land you operate is more than one hectare (ha) and is located in a vulnerable wellhead protection area you may need a risk management plan when applying pesticides.

The following items may be part of a risk management plan:

- Review the mapping (with custom operator as well) to ensure awareness of where the wellhead protection area is located.
- Scout fields for weeds to confirm infestation rate and if spraying is required.
- Use proper plant management to improve plant health and reduce need for pesticides.
- Enter the GPS coordinates provided by the risk management official, into the sprayer data system, if applicable, to ensure accuracy of spraying.
- Apply pesticide only as per manufacturer's direction and registration, for example, tank mixes and Pest Management Regulatory Agency registration.

- Take proper actions to reduce drift, for example, nozzle selection, water pressure and droplet size.
- Avoid times of high winds or prior to heavy rain.
- Regularly calibrate sprayers.
- Use best management practices to reduce soil erosion and runoff.
- Apply pesticides with precision to reduce application volume.
- Ensure that only properly trained and certified persons apply pesticide.
- Prevent potential spills in vulnerable areas by ensuring that no vehicles containing quantities of pesticide will be parked in the area.

Storage of Pesticide

- If you store more than 250 kg of liquid or solid pesticide in a wellhead protection area of high vulnerability it will require a risk management plan

After April 1, 2015 no NEW storage of pesticides more than 250 kg will be allowed in a wellhead protection area with high vulnerability.

How can reduce risk posed to water sources by application of non-agricultural source material and agricultural source material, grazing/pasturing, outdoor confinement yards?

Here are some activities, on farms in municipal wellhead protection areas, which could pose a significant threat to drinking water, if not properly managed:

- Storage and application of manure (agricultural source material or ASM) .
- Storage and application of non-agricultural source materials (NASM) such as sewage or processing by-products or offal.
- Outdoor confinement yards, grazing, or pasturing.

Could your farming practices require risk management to ensure that municipal sources of drinking water are not at risk?

Here are some questions to think about:

- Is the land you operate on in a municipal wellhead protection area? If so, which zone is the land located in? (WHPA A, B, or C).
- What is the vulnerability score of the area?
- Does the wellhead protection area cover your whole property or just part of it?
- Do you apply or store ASM or NASM in these vulnerable areas?
- Do you graze animals or operate an outdoor confinement yard in these areas?
- If storing ASM, is the volume stored sufficient to land apply at a rate that is greater than one nutrient unit per acre?
- If storing NASM, is the storage above ground and greater than five tonnes, or a permanent storage facility below ground and at least .05 tonnes? Or, does it contain material generated from a meat plant?
- If grazing and pasturing, would greater than onenutrient unit per acre be generated?

Agricultural producers located near drinking water sources may be required to review and update their current regulatory approvals (for example, Nutrient Management Strategies and Nutrient Management Plans) or implement new management practices (e.g., a risk management plan) to make sure their operations use best management practices and do not put water sources at risk.



What the local source protection plans say:

If the land you operate is in the 100-metre zone of a municipal wellhead protection area, application or storage of ASM or NASM will be prohibited after April 1, 2015.

If the land you operate is in the 100-metre zone of a municipal wellhead protection area, grazing or pasturing (where greater than one nutrient unit would be generated) and the operation of an outdoor confinement area will be prohibited after April 1st, 2015.

If the land you operate is in a municipal wellhead protection area but outside of the 100-metre zone, you may need a risk management plan when applying ASM or NASM, when grazing or pasturing, or, operating an outdoor confinement yard.

Here are some things that may be considered when developing your risk management plan:

- If you have a Nutrient Management Strategy or Plan it will be reviewed to see if it offers adequate protection. You may still require a risk management plan.
- If you do not have a Nutrient Management Strategy or Plan, then a Risk Management Plan will be developed in negotiation with you.
- Proper grazing management may be considered to ensure that contaminants do not pose a risk to municipal sources of drinking water.

Your local staff and municipal risk management official (RMO) will be happy to answer any questions you have.



What is a risk management plan?

A risk management plan is generally negotiated between a person doing an activity (such as storing home heating oil) and a municipal risk management official.

The risk management plan (RMP) regulates those activities, in protection areas around municipal wells, that pose a significant drinking water threat to drinking water sources.

The risk management plan includes best management practices and other measures designed to ensure that risks to the municipal drinking water source are reduced or eliminated.

For example, if fuel stored at a service station was a significant threat to drinking water, a risk management official would work with the gas station owner. Together, they would develop a risk management plan to reduce the chance of spills from an underground tank.

The risk management plan may be simple and straightforward in cases where best management practices are already in place. The plans can be amended as activities and operations change over time.

Talk to staff in the region or to your risk management official to find out more.

What is a risk management official?

The risk management official (RMO) negotiates risk management plans with persons engaged in an activity such as storing chemicals or applying pesticides.

The official also issues notices in certain areas regarding changes in land uses, new building construction, or changes in building construction.

A risk management official is appointed by

the municipality and trained to standards set by provincial regulation. Their training includes biosecurity, health and safety, and more.

In the Ausable Bayfield Maitland Valley Source Protection Region, many of the municipalities have delegated their authority to the Ausable Bayfield Conservation Authority to provide risk management services on their behalf.

What is a risk management inspector?

A risk management inspector (RMI) inspects activities to ensure compliance with the risk management plan.



Ausable Bayfield
Maitland Valley
Source Protection
Region

Contact us

We have tried to answer some of your questions in this booklet but it's often easier to answer questions and listen to comments when meeting one-to-one, either in person, on the phone, or by email. Free feel to contact our staff with your questions and comments.

You are also welcome to observe meetings of the source protection committee. Meetings are posted on your local source protection website.

Our contact information is below. Thanks for helping to protect water in Lake Huron and local wells.

Ausable Bayfield Maitland Valley Drinking Water Source Protection Region

c/o 71108 Morrison Line, RR 3 Exeter, ON N0M 1S5

1-888-286-2610

sourcewaterinfo.on.ca

Maitland Valley Source Protection Area: 519-335-3557

Ausable Bayfield Source Protection Area: 519-235-2610

sourcewaterinfo.on.ca

519-235-2610 • 1-888-286-2610

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