IMPLEMENTATION
RESOURCE GUIDE

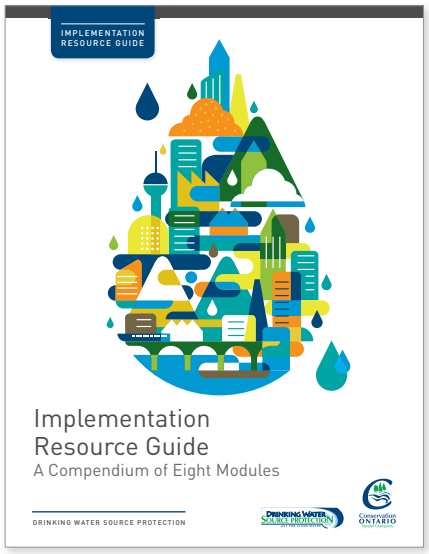
MODULE 2

Understanding Where Policies Apply

DRINKING WATER SOURCE PROTECTION

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Conservation ONTARIO
Natural Champions

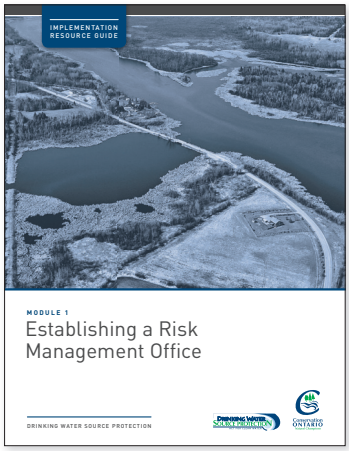


Implementation Resource Guides

A Compendium of Eight Modules

Look for all eight modules in our Drinking Water Source Protection series. You can find them at **www.conservation-ontario.on.ca**

MODULE 1



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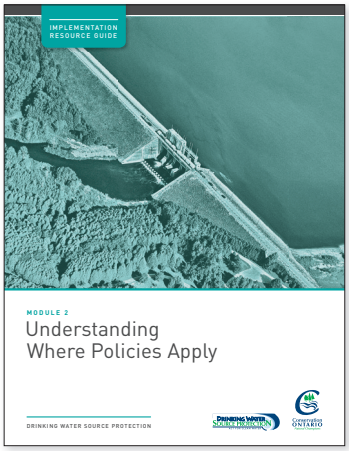

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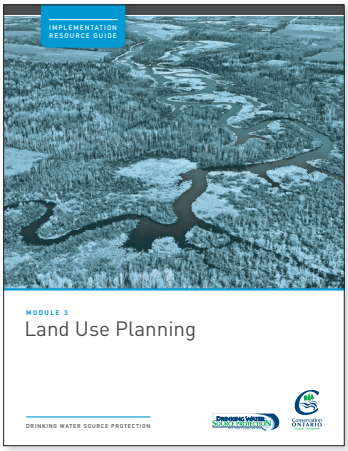

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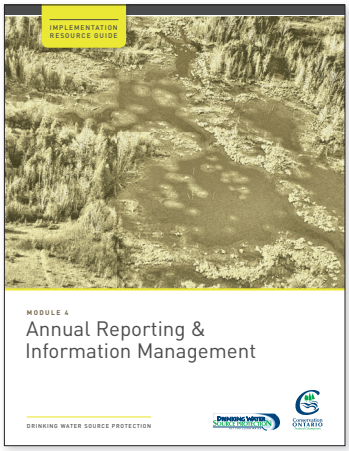

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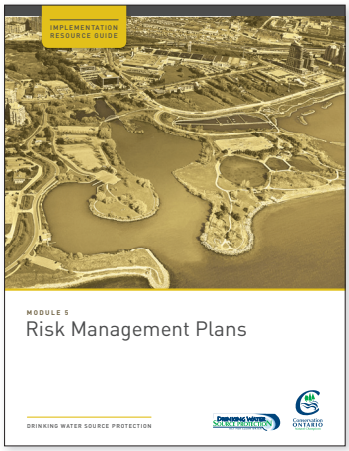

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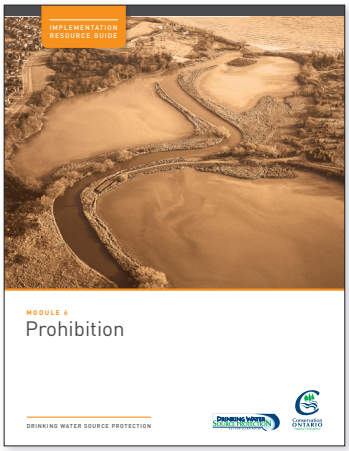

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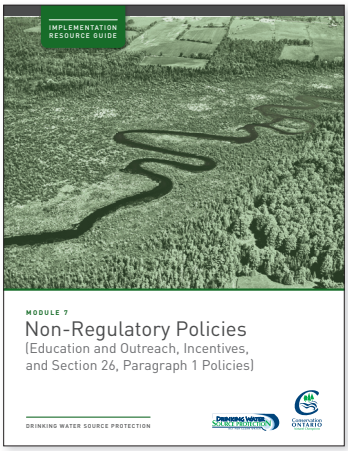

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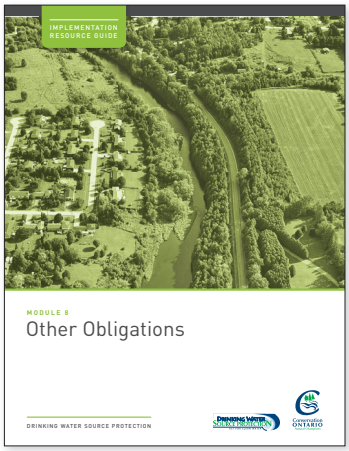

Module 2: Understanding Where Policies Apply

Implementation Resource Guide

06/05/2014

Note to Reader: This document is one of a series developed by staff at conservation authorities and Conservation Ontario in support of source protection plan implementation. These documents cover a variety of tools related to plan implementation, but not all will apply in your municipality. Consult your local source protection plan to determine which policies are applicable in your municipality. This document has not been reviewed by legal counsel and is not presented as legal advice.

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A. Purpose of This Module

This module is the second in a series of documents developed for use by municipalities to assist with preparing for the implementation of source protection plans. This module is intended to assist municipal staff, Risk Management Officials and Risk Management Inspectors with implementing the policies in the source protection plan. By the end of this module, you will understand:

- what a vulnerable area is
- how to identify a vulnerable area
- how vulnerability scores are calculated
- what a significant drinking water threat is
- how to identify significant drinking water threats
- how to determine if a source protection plan policy applies

B. The Need for a Threats Verification

The threats identification in the Assessment Reports was based on a preliminary understanding of activities which were believed to be taking place at the time of the assessment. These initial threat counts serve as an estimate of the scope of work necessary to implement the source protection plan. Verifying the existence of these threats is therefore the necessary first step in initiating the implementation of the policies of the source protection plan, including initiating the development of Risk Management Plans where they are required.

Consult with your source protection region before undertaking this threats verification to gain a better understanding of the quality of data collected on threats identification in the Assessment Reports.

Some municipalities will have staff in place to begin this exercise prior to approval of the source protection plan, while others may not. For some source protection regions and areas, the threats verification exercise will be straightforward. For others, the process will be more complex.

Timelines for the threats verification will vary depending on the region, number and types of threats; therefore, it is highly advisable to plan ahead for unexpected delays. For example, in large urban areas, the field verification task may be more onerous, and can quickly become outdated as new businesses emerge and others close down.

C. Data Management

The process you undertake to verify threats will serve as the basis for the rest of your implementation efforts. How you track your efforts will be important. Refer to Module 4 for further details about ongoing data management and reporting requirements.

D. Entering Property to Verify Threats

You may require access to private property to verify significant drinking water threats. Section 88 of the *Clean Water Act, 2006* allows an employee or agent of a source protection authority to enter private property in order to collect data and information that is relevant to the preparation of an Assessment Report, a source protection plan, an interim/annual progress report, or for the purposes of conducting a monitoring program for implementation of source protection plans.

As well, a Risk Management Inspector has inspection and property entry powers, which gives the Inspector authority to access property for the purposes of inspections and collecting data/information. This may include inspecting significant threat activities designated by the source protection plan under Section 57 (which prohibits activities) or Section 58 (requires a Risk Management Plan for the activity).

While the *Clean Water Act* provides powers of entry, it is expected that, under most circumstances, a trained person will enter with the consent of the property owner and will be accompanied by the property owner. Therefore, it is important for anyone likely to be engaged in the verification of threats to complete the Ministry of the Environment mandated training. The Property Entry Training Course, developed by the Ministry, is the model for property entry skills and knowledge taught to persons likely to enter private property for the purposes of compliance with the *Clean Water Act.*

For information on the Ministry of the Environment Property Entry training, contact the Source Protection Programs Branch by email: sourceprotection@ontario.ca.

E. Useful Supporting Documents

i. Assessment Reports

Assessment Reports are technical documents which describe the local watershed, assess the available water supply, map vulnerable areas and identify threats in these vulnerable areas that pose risks to our drinking water. In some cases, threats were identified through a desktop exercise only. A multi-stakeholder source protection committee, with representation from the public sector, as well as local interests such as farming, business, environmental and public health organizations, municipalities and First Nations in some regions, completed Assessment Reports for the source protection area. The Assessment Reports enumerate significant drinking water threats to determine the extent and scope of threat activities, and this information contributed to the development of policies in source protection plans.

Contact your local source protection authority to request a copy of your local approved Assessment Report.

ii. Source Protection Plans

Source protection plans contain a series of policies developed by the source protection committee in consultation with the local community to protect municipal drinking water sources from existing and future drinking water threats. The *Clean Water Act* and the Ontario Regulation 287/07 establish the requirements governing the contents of a source protection plan. In particular, Ontario Regulation 287/07 requires that the source protection plan contain the following objectives:

- policies to protect existing and planned drinking water sources, and
- policies for every area where threats could be significant to ensure that the activities identified as significant drinking water threats either never become a significant threat or, if the activity is already taking place, the activity ceases to be a significant threat.

Contact your local source protection authority to request a copy of your local source protection plan.

iii. Provincial Tables of Drinking Water Threats

The Provincial Tables of Drinking Water Threats document drinking water threats and the level or risk associated with that threat under certain circumstances.

These tables include:

- the prescribed activities that can be identified as threats,
- the circumstances which make them threats,
- the vulnerable areas where those activities can be identified as threats, and
- the level of risk that the threat poses based on the above details.

Find the Provincial Tables of Drinking Water Threats at http://www.ontario.ca/environment-and-energy/tables-drinking-water-threats

iv. Provincial Tables of Circumstances

The Provincial Tables of Circumstances are designed to enable the reference of threats by vulnerable area types (i.e. groundwater, surface water); contaminant type (i.e. chemical, pathogen, DNAPL); vulnerability score; and, threat level (i.e. significant, moderate, low). Based on the possible combinations of vulnerable areas, vulnerability scores and the types of parameters associated with the threats sub-categories, 76 different Provincial Tables of Circumstances are available. These tables contain the same information as the Provincial Tables of Drinking Water Threats, just presented in a different format.

Find the Provincial Tables of Circumstances at http://www.ontario.ca/ministry-environment.

v. Mapping Database

All 19 source protection regions submitted their vulnerability and threats assessment data, in geodatabase format, to the Ministry of the Environment using a tool called the Assessment Report Database. This geodatabase contains a summary of all significant drinking water threats that were identified in vulnerable areas. Each municipality will have received or will be receiving a copy of the geodatabase or geographical information systems data relevant to its jurisdiction from the local source protection authority. You can use this data to integrate source protection information into the mapping programs (e.g., ArcGIS) currently available in your municipality. If your municipality is unable to accept geodatabase or geographical information systems data, contact your local source protection authority to obtain the data in an alternate format.

The Ministry of the Environment also has plans for a province-wide web mapping portal where implementing bodies can find the vulnerable area, vulnerability score and the relevant significant drinking water threats that apply in each area. This portal is scheduled to be launched in 2014. Your local source protection authority will be able to provide information regarding the status of this tool.

F. Some Terms You Need to Know

i. Technical Rules

Throughout this document, reference is made to the Technical Rules. The Technical Rules were developed by the Ministry of the Environment and establish requirements for completing the technical work required to be included in an Assessment Report.

Find the Technical Rules at http://www.ontario.ca/ministry-environment.

ii. The Director

Also in this document, reference will be made to the Director. The Director refers to the Director of Source Protection Programs Branch at the Ministry of the Environment.

G. Vulnerable Areas and Vulnerability Scoring

The *Clean Water Act* requires that policies are developed to protect municipal drinking water sources from activities that are or would be significant drinking water threats. The *Clean Water Act* identifies four types of vulnerable areas:

1. Wellhead Protection Areas (WHPAs)
2. Surface Water Intake Protection Zones (IPZs)
3. Highly Vulnerable Aquifers (HVAs)

4. Significant Groundwater Recharge Areas (SGRAs)

i. Wellhead Protection Areas

A WHPA is the area of land around a municipal well, the size of which is determined by how quickly water travels underground to the well, in relation to the subsurface geology (rocks and sediments), and water extraction rates. This measurement is generally described in years and referred to as "time of travel."

The different WHPAs around a municipal well are:

1. WHPA-A: The 100-metre radius around the wellhead.
2. WHPA-B: The area within which the time of travel to the well (within the aquifer) is up to and including two years (excluding WHPA-A).
3. WHPA-C: The area within which the time of travel to the well (within the aquifer) is up to and including five years (excluding WHPA-A and WHPA-B).
    - WHPA-C1: In situations where the WHPA was delineated before 2005, a WHPA-C may not have been delineated. In these cases, WHPA-C1 is provided instead. It is the area within which the time of travel to the well (within the aquifer) is up to and including 10 years (excluding WHPA-A and WHPA-B).

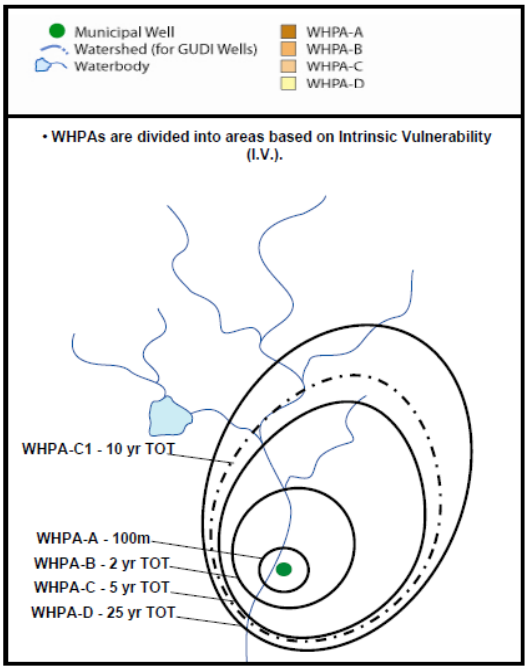


Figure 1: Wellhead Protection Areas (Ministry of Environment, 2012)

4. WHPA-D: The area within which the time of travel to the well (within the aquifer) is up to and including 25 years (excluding WHPA-A, WHPA-B, WHPA-C and WHPA-C1).
5. WHPA-E: This area is delineated when municipal groundwater supplies are considered to be under the direct influence of surface water (groundwater under the direct influence or GUDI). If a well is designated as GUDI, there is a requirement to determine the point of influence between surface water bodies or natural courses which can deliver surface water to the well in a short amount of time (measured in hours) when compared to a well not under the direct influence of surface water. If the exact point of influence is unknown, the nearest surface water body is assumed to be the point of influence.
6. WHPA-F: Is only delineated when a WHPA-E is delineated, and the well is subject to issues which originate from outside the other parts of the WHPA. The WHPA-F is delineated by following the IPZ-3 Technical Rules.

Figure 1 provides an example of the four typical WHPAs associated with municipal wells.

Vulnerability Scoring for Wellhead Protection Areas

Each WHPA is further assessed for the intrinsic vulnerability (natural vulnerability) of the aquifers. The intrinsic vulnerability is evaluated by assessing how the geology, geography, hydrogeology, and soil (among other things) work together to affect the speed at which water moves toward it. The outcome of the intrinsic vulnerability assessment is a map that reports the vulnerability as high, medium or low (Figure 2).

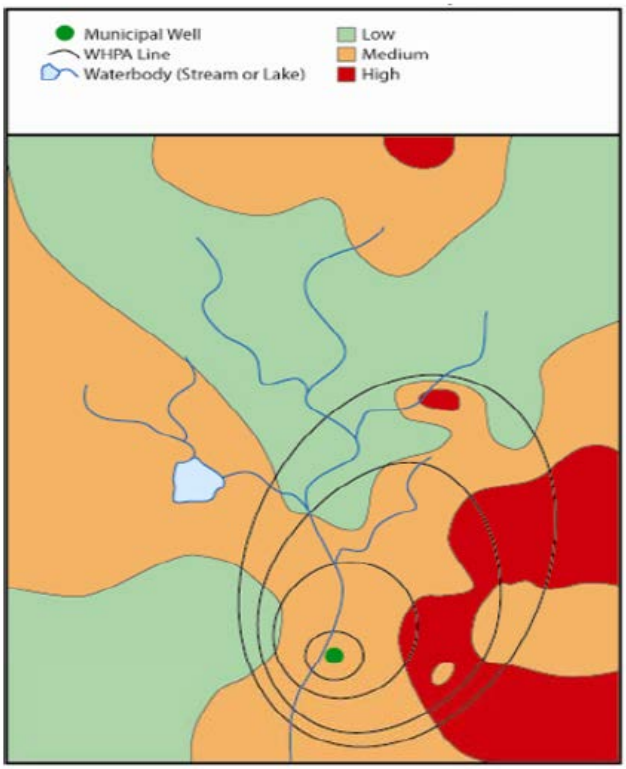


Figure 2: Intrinsic Vulnerability (Ministry of Environment, 2012)

Once the intrinsic vulnerability has been evaluated, vulnerability scores can be assigned within the WHAPs. The Technical Rules provide the guidance necessary to take the intrinsic vulnerability (high, medium or low) and translate it to a vulnerability score (based on a 10-point scale).

The first step to assigning vulnerability scores is overlaying the WHPAs capture zones onto the intrinsic vulnerability map (Figure 2). Table 1 shows an example of how the Technical Rules establish the relationship between the intrinsic vulnerability and the vulnerability score when using the intrinsic susceptibility index (ISI) or aquifer vulnerability index (AVI) methodology.

Within a WHPA-A, where the intrinsic vulnerability is high, medium or low, the table indicates that a vulnerability score of 10 is to be assigned. Within WHPA-B the table indicates that a vulnerability score of 10 is to be assigned where the intrinsic vulnerability is high, 8 where it is medium and 6 where it is low. A WHPA will have several vulnerability scores assigned within it,

even if the intrinsic vulnerability is the same across the wellhead. Figure 3 illustrates how the intrinsic vulnerability is translated to a vulnerability score using Table 1.

Table 1: Example Relationship between Vulnerability and Vulnerability Score

Vulnerability	Vulnerability Score				
	WHPA-A	WHPA-B	WHPA-C	WHPA-C1	WHPA-D
High	10	10	8	8	6
Medium	10	8	6	6	4
Low	10	6	4	4	2

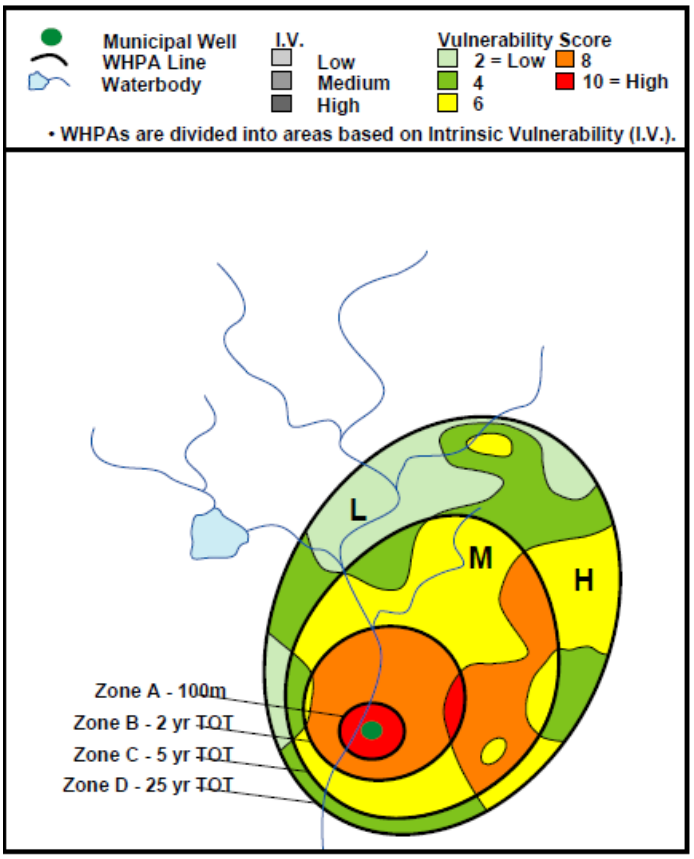


Figure 3: Relationship between Intrinsic Vulnerability and Vulnerability Scores (Ministry of Environment, 2012)

The vulnerability scores within the capture zones can be increased if a transport pathway is present. A transport pathway acts as a conduit or direct path for contaminants to get into the underground aquifer, for example, an old well that has not been abandoned properly. Another example of a transport pathway is an open aggregate pit or quarry that has removed the natural protective materials overlaying the municipal aquifer.

Table 2 summarizes the vulnerability scores required for a significant drinking water threat to be present within a WHPA.

Table 2: Vulnerability Score Required for a Drinking Water Threat to Be Significant in a WHPA

Threat Type	Vulnerable Area	Vulnerability Score Required for a Significant Threat
Chemical	WHPA- A, B,C,C1,D	8 – 10
	WHPA- E	8.1 – 9
Pathogen	WHPA- A and B	10
	WHPA -E	8 – 9
DNAPL	WHPA- A,B, C, C1	Any score

ii. Intake Protection Zones

An IPZ is the area of water and land immediately surrounding a surface water intake. It is based on the distance from the intake as well as the minimum response time for the water treatment plant operator to respond to adverse conditions or an emergency. The IPZ also includes the remaining watershed area upstream of the minimum travel time area, or an area where it can be demonstrated through modeling or other methods that a contaminant would reach the intake during an extreme event.

The Technical Rules classify surface water intakes according to the nature of the water source from which they draw water. Different methodologies are prescribed for the delineation of IPZs for each intake classification. Table 3 outlines the four intake classifications as they are outlined in the Technical Rules. In some cases, intakes are classified or re-classified based on other circumstances through approval granted by the Director of the Source Protection Programs Branch of the Ministry of the Environment.

Table 3: Definitions for Surface Water Intakes as Outlined in the Technical Rules

Intake Type	Description
A	Intake or the planned intake is or would be located in a Great Lake
B	Intake or the planned intake is or would be located in a connecting channel (e.g. St. Lawrence, St. Mary's, St. Clair, Detroit and Niagara rivers, and the Welland Canal)
C	Intake or the planned intake is or would be located in a river and neither the direction nor velocity of the flow of the water at the intake is affected by a water impoundment structure
D	If the intake is not a Type A, B or C (e.g., intakes located in inland lakes)

For each surface water intake, three IPZs are identified. Table 4 summarizes the methodologies for delineation of the vulnerable areas around a surface water intake.

Table 4: Methods for Delineating Vulnerable Areas around Surface Water Intakes

<table>
<tr><th></th><th>Intake Type</th><th>Delineation</th></tr>
<tr><td rowspan="3">Intake Protection Zone 1 (IPZ-1)
The area immediately around the intake.</td><td>A and D</td><td>Defined by a 1 km radius centered on the crib of the intake (Table 5).</td></tr>
<tr><td>B</td><td>Defined by a semi-circle that has a radius of 1 km extending upstream from the crib of the intake and a rectangle with a length of 2 km centred on the crib of the intake and a width of 100 metres extending downstream from the crib of the intake.</td></tr>
<tr><td>C</td><td>Defined by a semi-circle that has a radius of 200 metres extending upstream from the crib of the intake and a rectangle with a length of 400 metres centred on the crib of the intake and a width of 10 metres downstream of the intake.</td></tr>
<tr><td colspan="3">Note: The IPZ-1 is a fixed distance from the intake based on the sensitivity analysis of a massive sudden spill in the vicinity of the intake.</td></tr>
<tr><td>Intake Protection Zone 2 (IPZ-2)</td><td colspan="2">The IPZ-2 is defined as the area that may contribute water to the intake where the time of travel to the intake is equal to or less than the time that is sufficient to allow the operator of the system to respond to an adverse condition in the quality of the surface water. The Technical Rules indicate that a minimum 2-hour time of travel should be used to delineate the IPZ-2 (excluding IPZ-1).</td></tr>
<tr><td colspan="3">Note: The IPZ-2 represents the operator response time to shut down the drinking water system in case of a spill.</td></tr>
<tr><td>Intake Protection Zone 3 (IPZ-3)</td><td colspan="2">For all types of intakes, the IPZ-3 is defined as the area of the water and land that may lead to contaminants reaching an intake during an extreme event such as a one in one hundred year rainfall as determined through modeling or other methods (contaminant transport, boundary approach, combined approach). Significant threats are then identified if it can be shown through modeling that a release of a contaminant during an extreme event may be transported to the intake.

For type C and D intakes not located in Lake Nipissing, Lake Simcoe, Lake St. Clair, or the Ottawa River, the IPZ-3 is defined as the area within each surface water body that may contribute water to the intake within the watershed boundary.</td></tr>
<tr><td colspan="3">Note: The IPZ-3 is an area beyond the IPZ-1 and 2 and is delineated differently based on the intake type.</td></tr>
<tr><td colspan="3">For all intake types where the IPZ-1, IPZ-2 and IPZ-3 abuts land, a setback of less than or equal to 120 metres or the Conservation Authority Regulation limit is included, whichever, is greater. The set-back is measured from the high water mark of the surface water body that encompasses the area where overland flow drains into the surface water body and the areas of the Conservation Authority Regulation limit along the abutted land.</td></tr>
</table>

Vulnerability Scoring for Intake Protection Zones

As was the case with the WHPAs, the vulnerable areas around a surface water intake have also been assigned a vulnerability score (Figure 4, Figure 5, Figure 6).

The vulnerability scores required for an activity to be designated as a significant drinking water threat, taking into consideration the type of threat and the vulnerable area around a surface water intake, are outlined in Table 5. Note Table 5 does not apply when significant drinking water threats are identified under the issue or events based approaches discussed in Sections 9 (II) and (III) respectively. Note also that intakes located in the Great Lakes or connecting channels do not have a vulnerability score associated with their IPZ-3 as per the Technical Rules.

Table 5: Vulnerability Score Required for a Significant Drinking Water Threat in an IPZ

Threat Type	Vulnerable Area	Vulnerability Score Required for a Significant Threat
Chemical	IPZ/WHPA-E	8 – 10
Pathogen	IPZ-WHPA-E	8 – 10
DNAPL	IPZ/WHPA-E	10

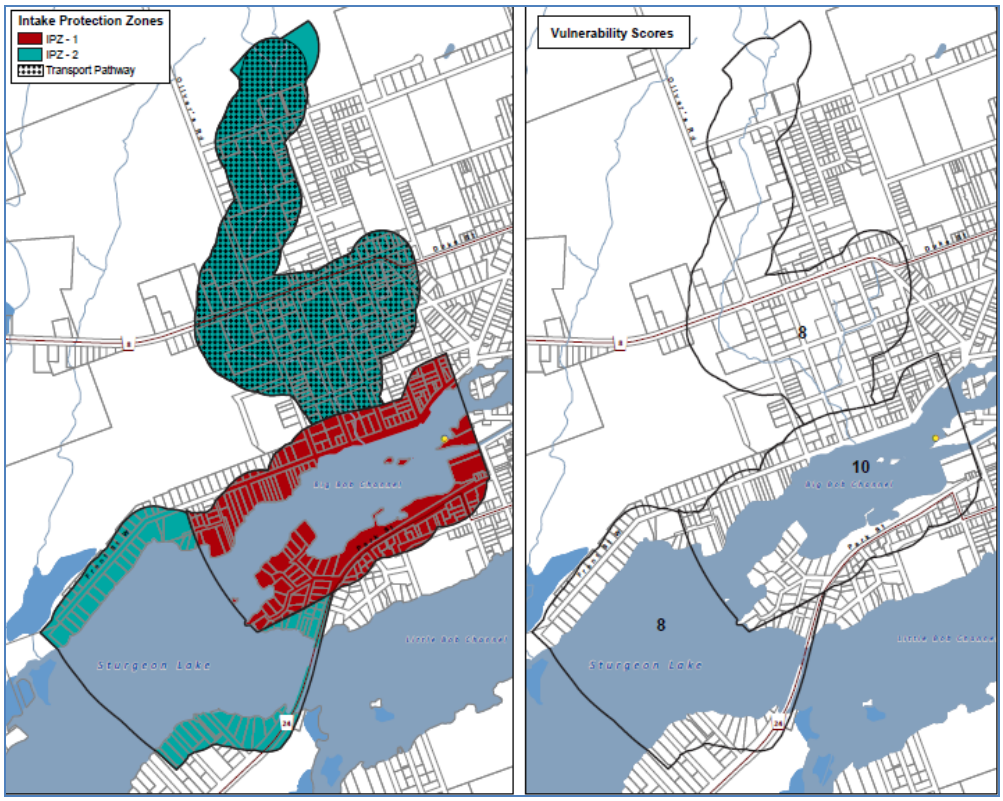


Figure 4: Type D Intake Protection Zones 1 and 2 Showing Vulnerability Scores Assigned

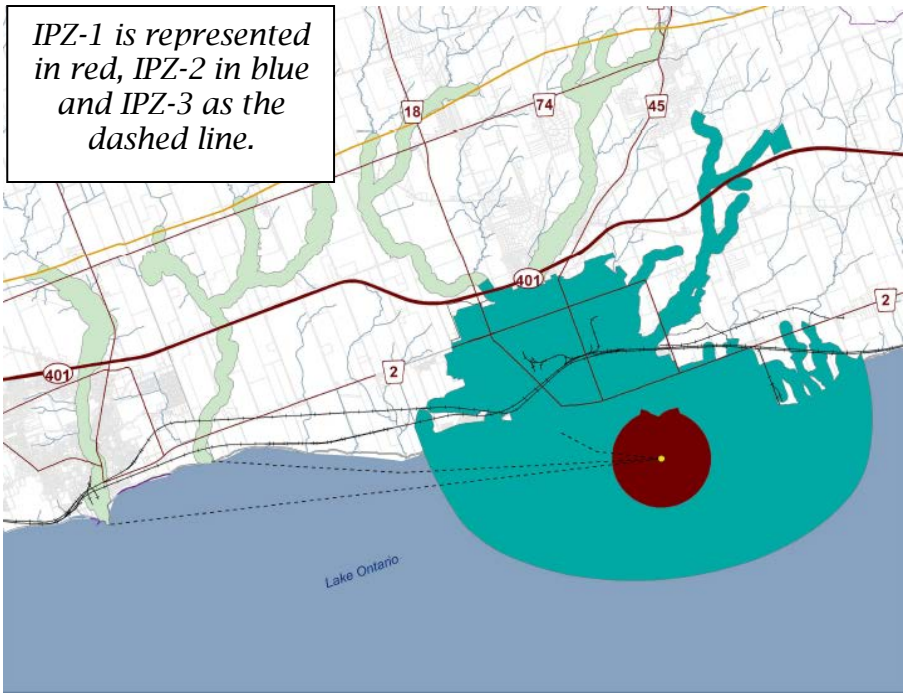


Figure 5: Three Intake Protection Zones for a Type A (Great Lakes) Intake

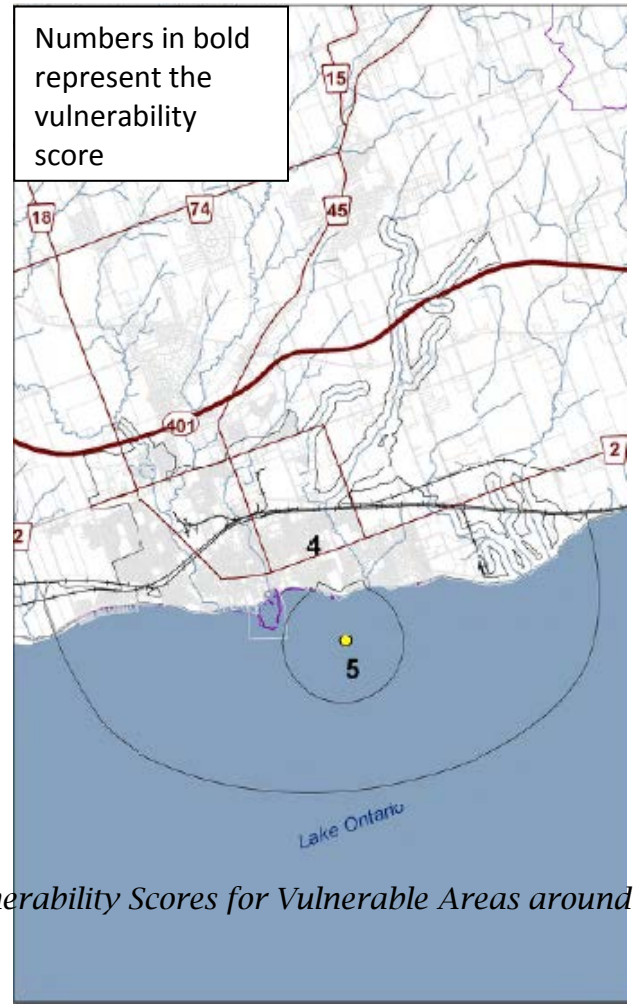


Figure 6: Vulnerability Scores for Vulnerable Areas around Type A Intake

iii. Highly Vulnerable Aquifers

Although HVAs are one of four types of vulnerable areas identified under the *Clean Water Act*, significant drinking water threats cannot be found in HVAs, unless an identified issue is present. For an issue to be present in a HVA, the issue contributing area for a municipal system would have been extended to incorporate the HVA. If this is the case, significant threats associated with the issue can be located within the entire delineated issue contributing area. The issue contributing area is discussed in Section 9 (II).

iv. Significant Groundwater Recharge Areas

Although SGRAs are one of four types of vulnerable areas identified under the *Clean Water Act*, significant drinking water threats cannot be found in SGRAs, unless an identified issue is present. For an issue to be present in a SGRA, the issue contributing area for a municipal system would have been extended to incorporate the SGRA. If this is the case, significant threats associated with the issue can be located within the entire delineated issue contributing area. The issue contributing area is discussed in Section 9 (II).

H. Threats

A threat is an activity 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 that is prescribed by the Regulations as a drinking water threat. The Province has prescribed 21 threats to municipal drinking water sources. The identified activities or conditions are considered to be chemical, pathogen or dense non-aqueous phase liquid (DNAPL) threats.

Each of the activities prescribed to be drinking water threats under the *Clean Water Act* are those considered to be undertaken by humans. These activities are listed in Ontario Regulation 287/07 and examples of each activity are summarized and sorted by category in Table 7.

Table 6: Prescribed Drinking Water Threats under the Clean Water Act, 2006

Threat #	Prescribed Drinking Water Threat Activity	Examples of Threat
1	The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act.*	Storage of PCBs and other hazardous waste, landfilling of hazardous, non-hazardous, municipal or commercial waste, and land application of untreated septage.
2	The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage.	Septic systems, stormwater treatment ponds, discharge of industrial effluent, sewage treatment plants, and sanitary sewer systems.
3 **4**	The application of agricultural source material to land. The storage of agricultural source material.	Manure produced by farm animals, and run-off from farm yards and manure storages.
5	The management of agricultural source material.	Facilities that cultivate fish or other aquatic organisms in a controlled environment.
6 **7**	The application of non-agricultural source material. The handling and storage of non-agricultural source material.	Land application of sewage biosolids or other similar wastes.
8 **9**	The application of commercial fertilizer to land. The handling and storage of commercial fertilizer.	Contaminants of interest include nitrogen and phosphorus.
10 **11**	The application of pesticide to land. The handling and storage of pesticide.	Pesticides of interest include the chemicals used to control weeds (herbicides), or fungi (fungicides) or those used as a soil fumigant to control fungi, and nematodes and weeds.
12 **13**	The application of road salt. The handling and storage of road salt.	Contaminants of interest include chloride and sodium.
14	The storage of snow.	Contaminants of interest include chloride, sodium, and petroleum hydrocarbons.
15	The handling and storage of fuel.	Bulk plants or facilities where fuel is manufactured, gas stations and cardlocks or keylocks, marinas, private storage such as farms and contractor yards, and heating

		oil tanks for homes and businesses.
16	The handling and storage of a dense non-aqueous phase liquid.	Dry-cleaning chemicals, paint and spot removers, rug-cleaning fluids, and varnishes.
17	The handling and storage of an organic solvent.	Paints, varnishes, lacquers, adhesives, glues, and degreasing or cleaning agents, and in the production of dyes, polymers, plastics, textiles, and printing inks.
18	The management of run-off that contains chemicals used in the de-icing of aircraft.	Airports using ethylene glycol to de-ice aircrafts.
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.	Water taken from Lake Simcoe and discharged into groundwater.
20 *	An activity that reduces the recharge of an aquifer.	Increasing impervious cover (parking lots).
21	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard.	Fields where livestock graze, and confinement areas outside barns.

** This implementation module does not detail the process to identify significant threats for water quantity (threats 19 and 20) as the process is unique for each water quantity threat identified. Water quantity threats are derived through Tier 3 Water Budget studies, in which your municipality was likely involved. To confirm the absence or presence of water quantity threats in your municipality, contact your local source protection authority.*

Table 7: Summary of Water Quality Threats by Threat Category

Threat Category	Threat #
Chemical	1,2,3,4,6,7,8,9,10,11,12,13,14,15,17,18,21
Pathogen	2,3,4,5,6,7,21
DNAPL	1,2,16

If an activity is not listed in Table 7, it does not fall within the scope of the *Clean Water Act*. Examples of activities outside the scope of the *Clean Water Act* include geothermal power, pharmaceuticals and personal care products, and disposal of imported fill. However, activities not strictly identified above can be added as "local" threats. See Section 9 (v) for a description of local threats.

The 21 potential threats above can be classified into three categories: low, moderate or significant – based on a calculated risk score. The process for determining a risk score is discussed next.

I. Approaches for Identifying Significant Drinking Water Threats

There are five ways to identify significant drinking water threats, as prescribed under the *Clean Water Act*:

1. threats based approach
2. issue based approach
3. events based approach
4. conditions based approach
5. local threats based approach

According to the *Clean Water Act*, there must be policies for all activities classified as significant drinking water threats. Policies must address activities that currently occur as well as any activities that may occur in the future.

Each source protection committee is given the option of creating policies for moderate or low drinking water threats. Review your local source protection plan to determine whether or not policies were developed for these threats in your area.

i. Threats Based Approach

The threats based approach is the most common way to identify drinking water threats. The foundation for the threats based approach is the risk score. A risk score is assigned to an activity that is based on a combination of hazard rating (of the specific activity) and vulnerability score (of the area where the activity takes place).

Risk Score = Hazard Rating x Vulnerability Score

Hazard ratings are the basis for the circumstances in the Tables of Drinking Water Threats, and are assigned scores on a scale of 2 – 10 by the Ministry of Environment. The scores were assigned by considering a number of factors, including but not limited to toxicity, quantity of contaminant released, and the frequency of association with pathogens.

Recall that the vulnerability score is assigned on a scale of 2 – 10 by considering the intrinsic vulnerability and time of travel.

Table 8 summarizes the risk scores required for an activity or condition to be considered a significant, moderate or low drinking water threat. A risk score of 80 – 100 is required for the activity or condition to be considered a significant drinking water threat.

Table 8: Summary of Risk Scores Required for Drinking Water Threats

Threat	Risk Score
Significant	80 – 100
Moderate	60 – 79
Low	41 – 59

For example, an activity with a hazard rating of 8 that takes place in an area where the vulnerability score is 8 has a risk score of 64.

Table 8 identifies it as a moderate threat. An activity assigned a hazard rating of 8 that takes place in an area where the vulnerability score is 10 has a risk score of 80.

Table 8 identifies it as a significant threat.

The risk scores required to have a significant drinking water threat are built into the Tables of Drinking Water Threats and Tables of Circumstances, meaning you do not need to explicitly calculate the risk score to identify significant drinking water threats. The Tables indicate when a specific circumstance is significant, moderate or low.

Using the Provincial Tables to Determine Threats

Tables of Drinking Water Threats

The Province established the Tables of Drinking Water Threats to identify circumstances in which activities are classified as drinking water threats. These tables can be used to identify circumstances where activities are significant threats and to indicate vulnerable areas where activities are or would be significant drinking water threats. To determine these circumstances and areas, it is important to understand how the tables are set up. Find the Tables of Drinking Water Threats at http://www.ontario.ca/environment-and-energy/tables-drinking-water-threats

Upper Thames River Conservation Authority has an interactive version of the table also available online:
http://maps.thamesriver.on.ca/swpCAMaps/threatsLookup/threats/threatsList.aspx

Table 9: Layout of the Tables of Drinking Water Threats

Location in Table	Field
Column 1	Activity (drinking water threat), based on the 19 water quality prescribed drinking water threats.
Column 2	Set of circumstances specific to a drinking water threat, including presence of contaminant parameters, volumes, and release into the environment.
Column 3	Vulnerable area (e.g. WHPA, IPZ)
Columns 4 – 6	Vulnerability scores identifying whether the activity under the set of circumstances is a significant, moderate or low drinking water threat.

Example: Determining Threats Using the Tables of Drinking Water Threats

Step 1: Identifying Drinking Water Threat (Table 10, Column 1)

- The establishment, operation or maintenance of a system that collects, transmits, treats or disposes of sewage.

Step 2: Review the Circumstances (Table 10, Column 2)

- Is the sewage system a stormwater management facility designated to discharge stormwater to land or surface water?
- Is the drainage area associated with the stormwater facility more than 10 hectares but not more than 100 hectares?
- Are the predominant land uses in the area rural, agricultural or low density residential?
- Could the discharge of stormwater result in the presence of lead or one or more of its compounds containing lead in groundwater or surface water?

If you answer "yes" to all of these questions, this circumstance would apply.

Step 3: Review the location of the activity (i.e., stormwater management facility) (Table 10, Column 3)

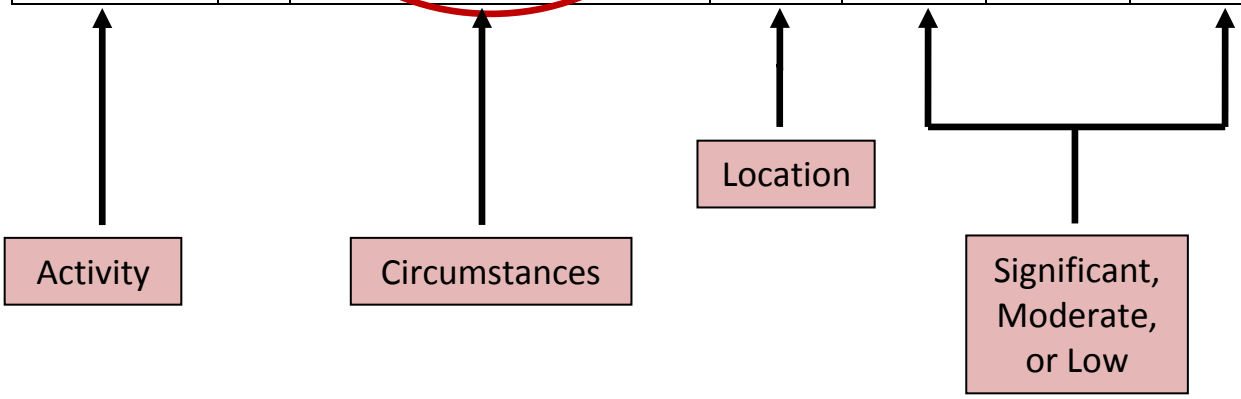
- Is the activity in the IPZ-1, IPZ-2, IPZ-3, or WHPA-E?
- Is the activity in the WHPA-A, WHPA-B, WHPA-C, WHPA-C1, or WHPA-D?
- Is the activity in a highly vulnerable aquifer area?
- Is the activity in a significant groundwater recharge area?

Step 4: Determine whether the threat is significant, moderate, or low (Table 10, Columns 4-6)

- If the activity in the IPZ-1, IPZ-2, IPZ-3, or WHPA-E with vulnerability score of 10, the threat is **significant**.
- If the activity is in the IPZ-1, IPZ-2, IPZ-3 or WHPA-E with a vulnerability score of 8 – 9, or WHPA-A, B, C and D with a vulnerability score of 10, the threat is **moderate**.
- If the activity is in the IPZ-1, IPZ-2, IPZ-3, or WHPA-E with a vulnerability score of 4.9 – 7.2, the threat is **low**.

Table 10: Sample from the Tables of Drinking Water Threats

Drinking Water Threats	Reference Number	Under the Following CIRCUMSTANCES	Areas Within Vulnerable Areas	Threat is Significant in Areas with a Vulnerability Score of	Threat is Moderate in Areas with a Vulnerability Score of	Threat is Low in Areas with a Vulnerability Score of
Column 1		Column 2	Column 3	Column 4	Column 5	Column 6
The establishment, operation or maintenance of a system that collects, transmits, treats or disposes of sewage.	522	1. The system is a storm water management facility designed to discharge storm water to land or surface water. 2. The drainage associated with the storm water management facility is more than 10 but not more than 100 hectares and the predominant land uses in the area are rural, agricultural, or low density residential. 3. The discharge may result in the presence of Lead or one or more of its compounds containing Lead in groundwater or surface water.	IPZ-1, IPZ-2, IPZ-3, and WHPA-E	10	8-9	4.9-7.2
			WHPA-A, WHPA-B, WHPA-C, WHPA-C1, WHPA-D		10	6.8
			HVA			6
			SGRA			6



Tables of Circumstances

The Provincial Tables of Circumstances contain the same information as the Tables of Drinking Water Threats, but are presented in a different format. Based on the possible combinations of vulnerable areas and vulnerability scores, 76 different Provincial Tables of Circumstances have been created. The Tables of Circumstances represent all of the different combinations for which there are provincially prescribed threats and circumstances within the Tables of Drinking Water Threats. There are five categories of tables:

1. Chemical tables for groundwater (WHPAs)
2. DNAPL tables for groundwater
3. Pathogen tables for groundwater
4. Chemical and DNAPL tables for surface water (IPZs)
5. Pathogen tables for surface water

Each of the five categories of tables have been further broken down into activities that are significant, moderate, or low drinking water threats depending on the vulnerability score of the

vulnerable area. As Table 11 demonstrates, 12 of the 76 Provincial Tables of Circumstances list circumstances where a threat could be significant (see Table 11).

The Tables of Circumstances were used to generate maps for each drinking water system (included in the Assessment Reports) that relate the vulnerability score for a WHPA or IPZ to the number and types of circumstances in the Tables of Drinking Water Threats. The maps in the Assessment Reports illustrate the areas around the municipal drinking water systems where land use activities either are (for the case of existing activities), or would be (for the case of potential future activities) significant, moderate or low drinking water threats. Embedded in these maps or in the Assessment Reports are tables to direct the reader to the appropriate list of threats that corresponds to the combination of vulnerable area, i.e. WHPA A-E or IPZ 1-3 and vulnerability score (10, 8, 6 or 2).

Determining Threats Using the Tables of Circumstances

Using Figure 7 as an example, the areas where significant, moderate, or low drinking water threats are present is shown for both chemical and pathogen threats. The embedded table demonstrates that, where the vulnerability score is 10 (Red), Provincial Tables 20 and 46 would list the circumstances under which an activity in that area would be considered a chemical or pathogen threat, respectively. The areas where the vulnerability score is 8 (orange) are where the circumstances listed in Provincial Tables 21 (chemical) and 47 (pathogen) would apply. Please note that the colouring used to illustrate the vulnerability scores in this example was not used by all source protection regions. Therefore, the mapping in your Assessment Report(s) may not be exactly the same.

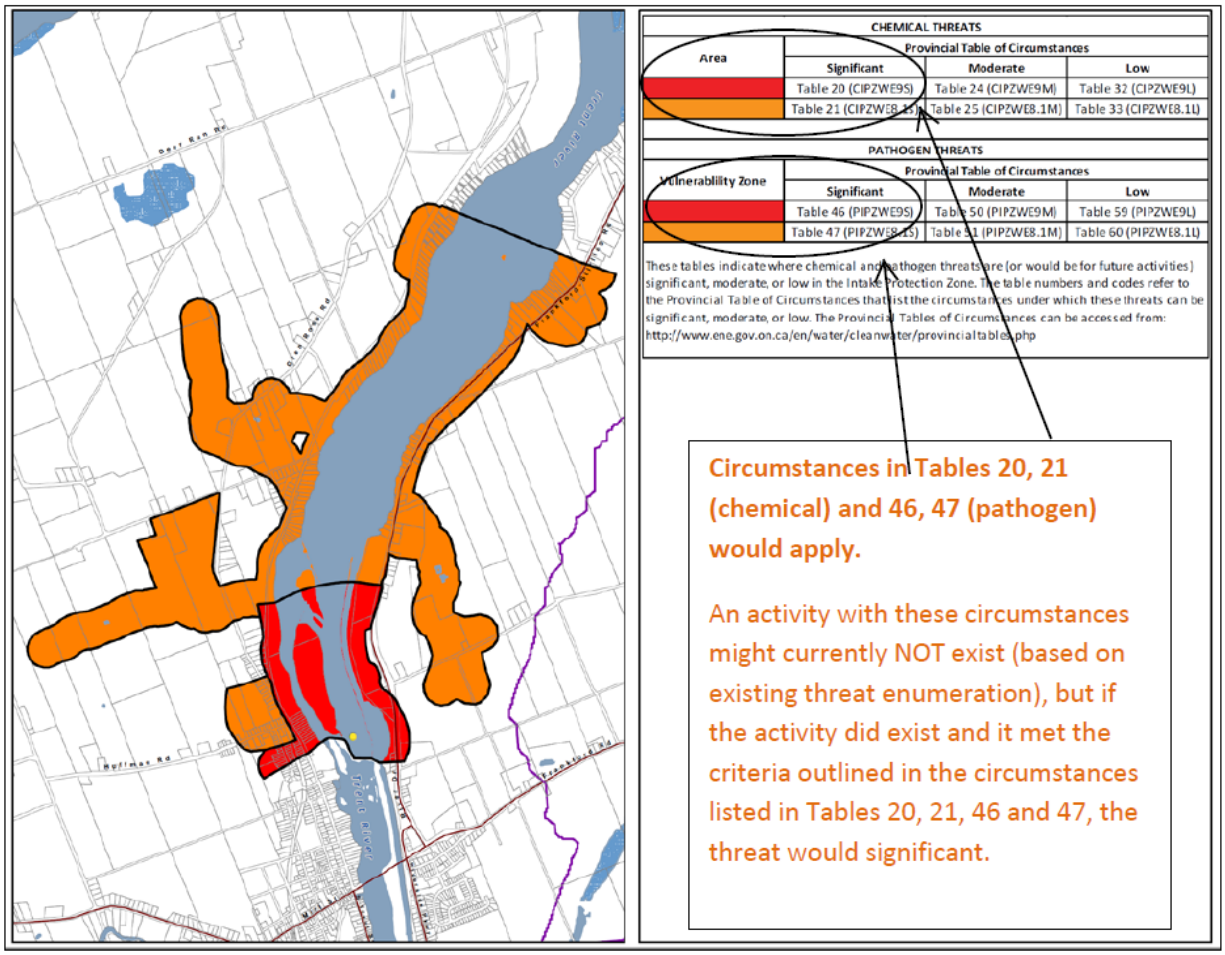


Figure 7: Areas for Significant, Moderate and Low Drinking Water Threats

A numerical code corresponds to each of the Provincial Tables of Circumstances. The code distinguishes between the type of threat (i.e., chemical, pathogen, DNAPL), the location of the activity (i.e., IPZ, WHPA), the vulnerability score, and the classification of the threat (i.e., significant, moderate or low). The Provincial Tables of Circumstances supports the Tables of Drinking Water Threats. As you complete the threat verification exercise, you will work extensively with both sets of Tables. For some threats and vulnerable areas you may find it easier to work with the Provincial Tables of Circumstances, while in other cases it will be easier to work with the Tables of Threats. For example, when screening for significant drinking water threats within WHPA-E, the Tables of Circumstances may be easier as you need to look at only a few pages instead of searching through each threat type in the Tables of Threats.

Table 11: Provincial Tables of Circumstances Where a Threat Could Be Significant

TABLE NUMBER	CODE	DESCRIPTION
1	CW10S	Chemicals in a WHPA with a vulnerability score of 10
2	CW8S	Chemicals in a WHPA with a vulnerability score of 8
19	CIPZ10S	Chemicals in an IPZ with a vulnerability of 10
20	CIPZWE9S	Chemicals in an IPZ or WHPA E where the vulnerability score is 9
21	CIPZWE8.1S	Chemicals in an IPZ or WHPA E where the vulnerability score is 8.1
22	CIPZWE8S	Chemicals in an IPZ or WHPA E where the vulnerability score is 8
9	DWAS	DNAPLS in WHPA A, B, C, C1, with any vulnerability
12	PW10S	Pathogens in WHPA A, B with a vulnerability of 10
45	PIPZ10S	Pathogens in an IPZ with a vulnerability of 10
46	PIPZWE9S	Pathogens in an IPZ or WHPA E with a vulnerability of 9
47	PIPZWE8.1S	Pathogens in an IPZ or WHPA E with a vulnerability of 8.1
48	PIPZWE88S	Pathogens in an IPZ or WHPA E with a vulnerability of 8

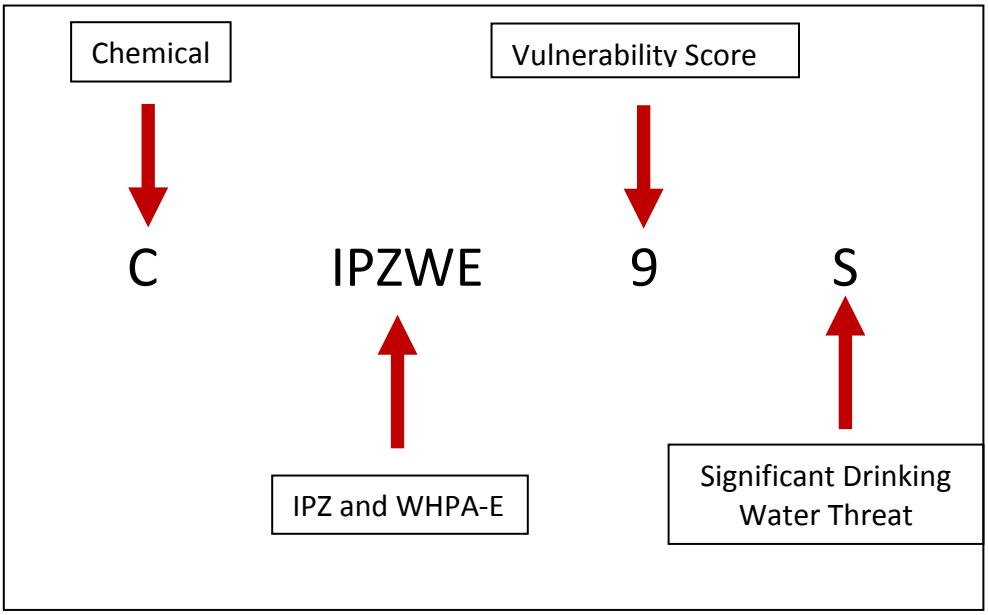


Figure 8: Understanding the Provincial Tables of Circumstances Codes (Example 1)

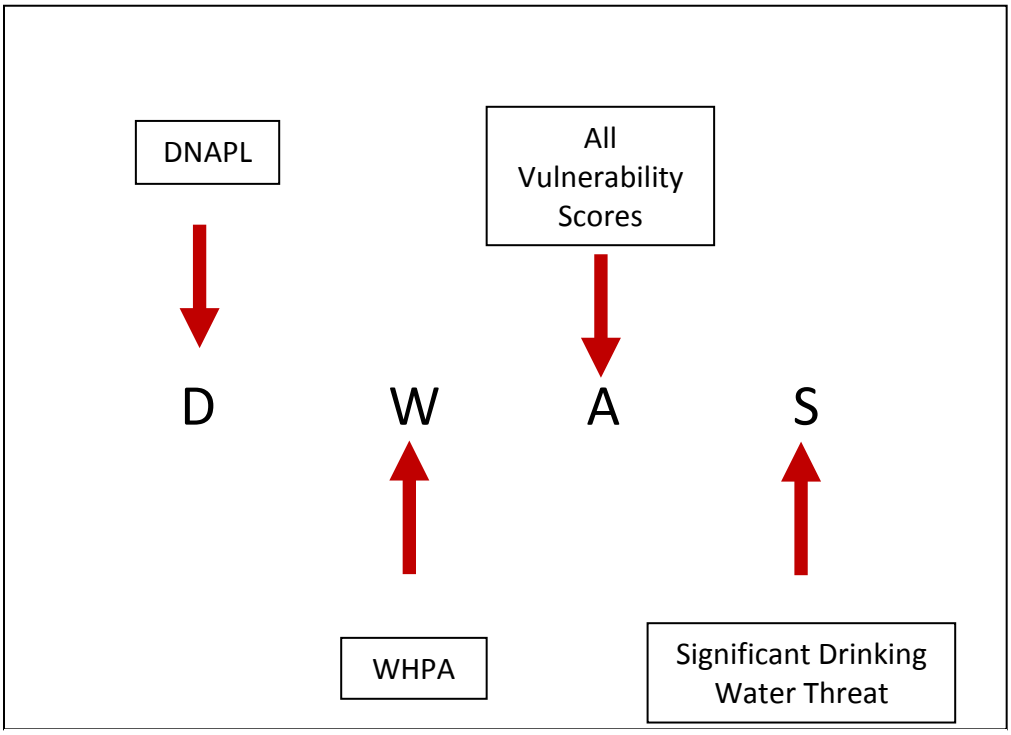


Figure 9: Understanding the Provincial Tables of Circumstances Codes (Example 2)

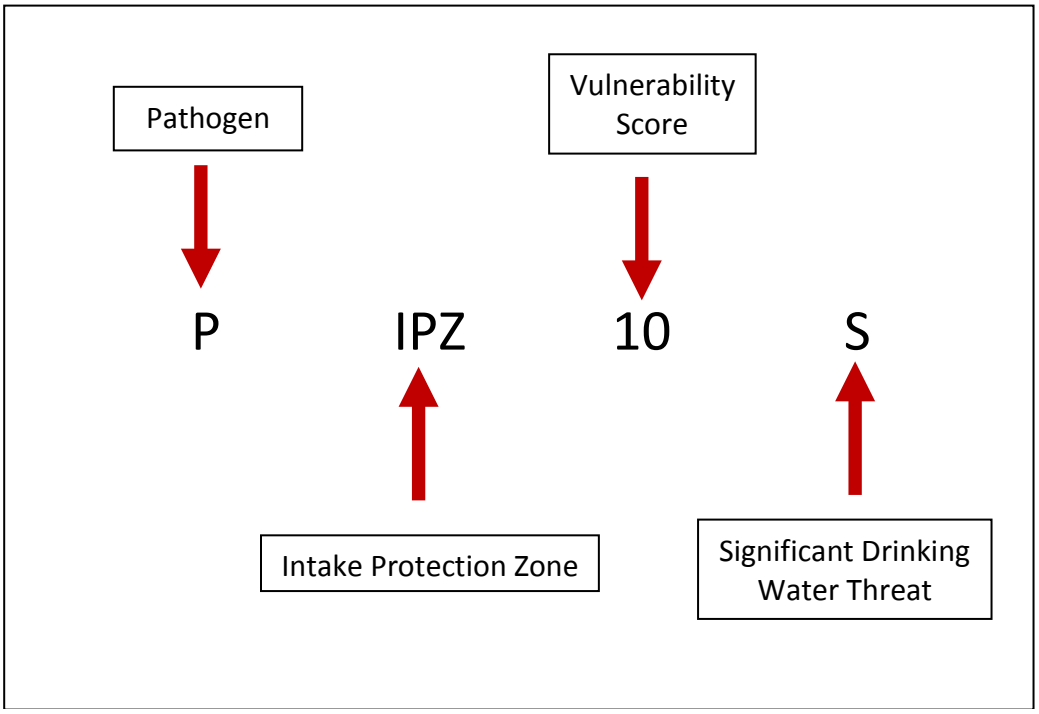


Figure 10: Understanding the Provincial Tables of Circumstances Codes (Example 3)

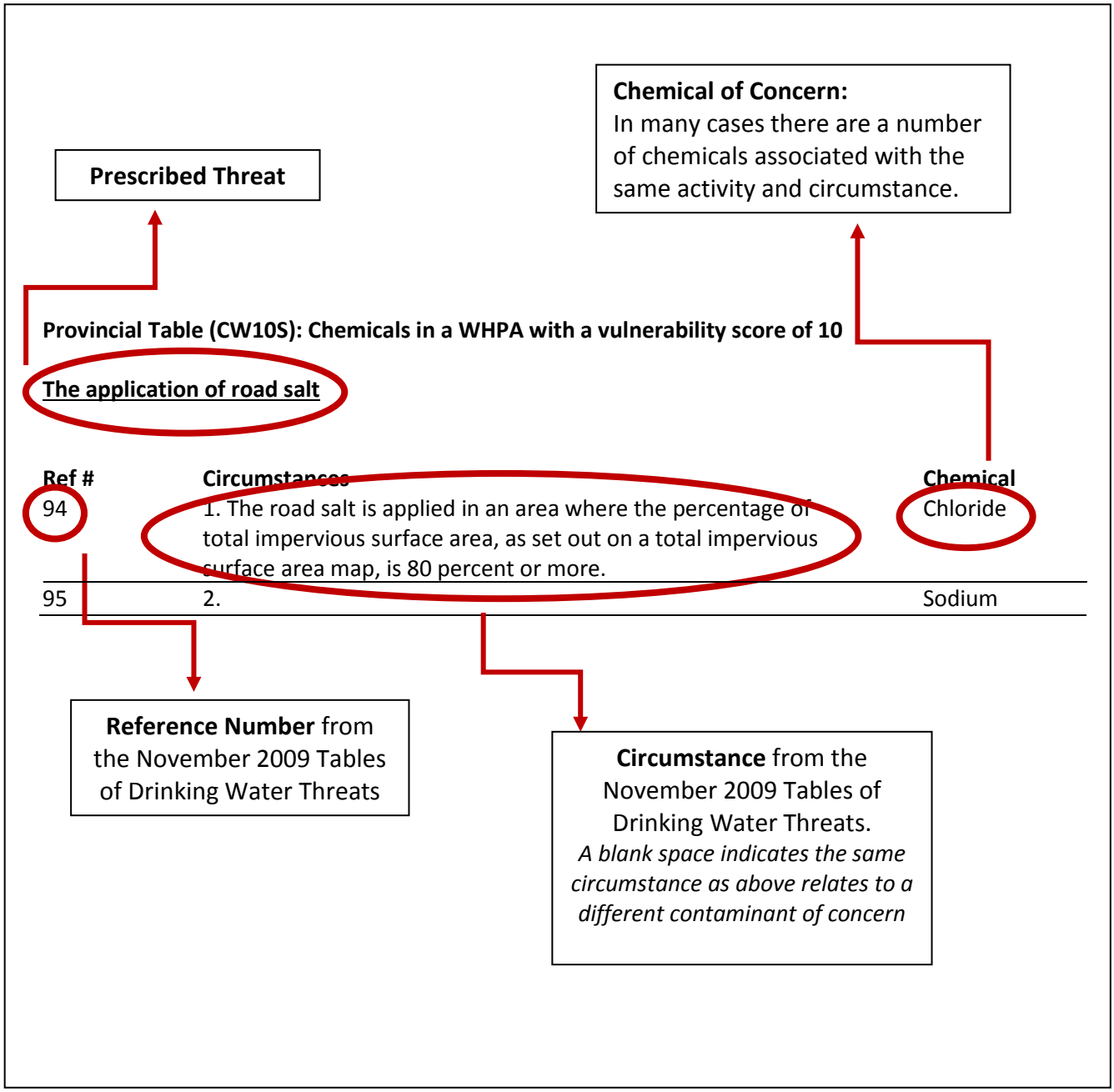


Figure 11: Understanding the Provincial Tables of Circumstances

ii. Issue Based Approach

An issue is defined under the *Clean Water Act* as an existing water quality problem associated with a municipal drinking water supply (this includes monitoring wells), or evidence of a trend that suggests a deterioration of water quality for one or more parameters. The Assessment Reports will identify any issues for each drinking water system.

The intent of the issues evaluation is to identify chemical or bacterial concentrations in raw drinking water at the drinking water system that will limit the ability of the water to serve as a drinking water source, either now or in the future. The presence of a contaminant in a well or drinking water system is determined through the analysis of available data and reports. To be considered a drinking water issue, a parameter needs to be at a concentration that is above the Ontario Drinking Water Quality Standards, or have an increasing trend that will lead to concentrations being above the standards, in accordance with the Technical Rules. A parameter may not be identified as an issue in cases where it is naturally occurring or effective treatment is in place. For example, both iron and manganese can occur naturally in the environment. Therefore, exceeding the Ontario Drinking Water Standards for these two metals in the data collected from a municipal drinking water system doesn't necessarily identify it as an issue.

The different source protection regions developed a process for identifying issues which met the Technical Rules. Figure 12 outlines an example process used by a few source protection regions to identify an issue. Consult your local Assessment Report for specific details on how issues were identified within your municipality.

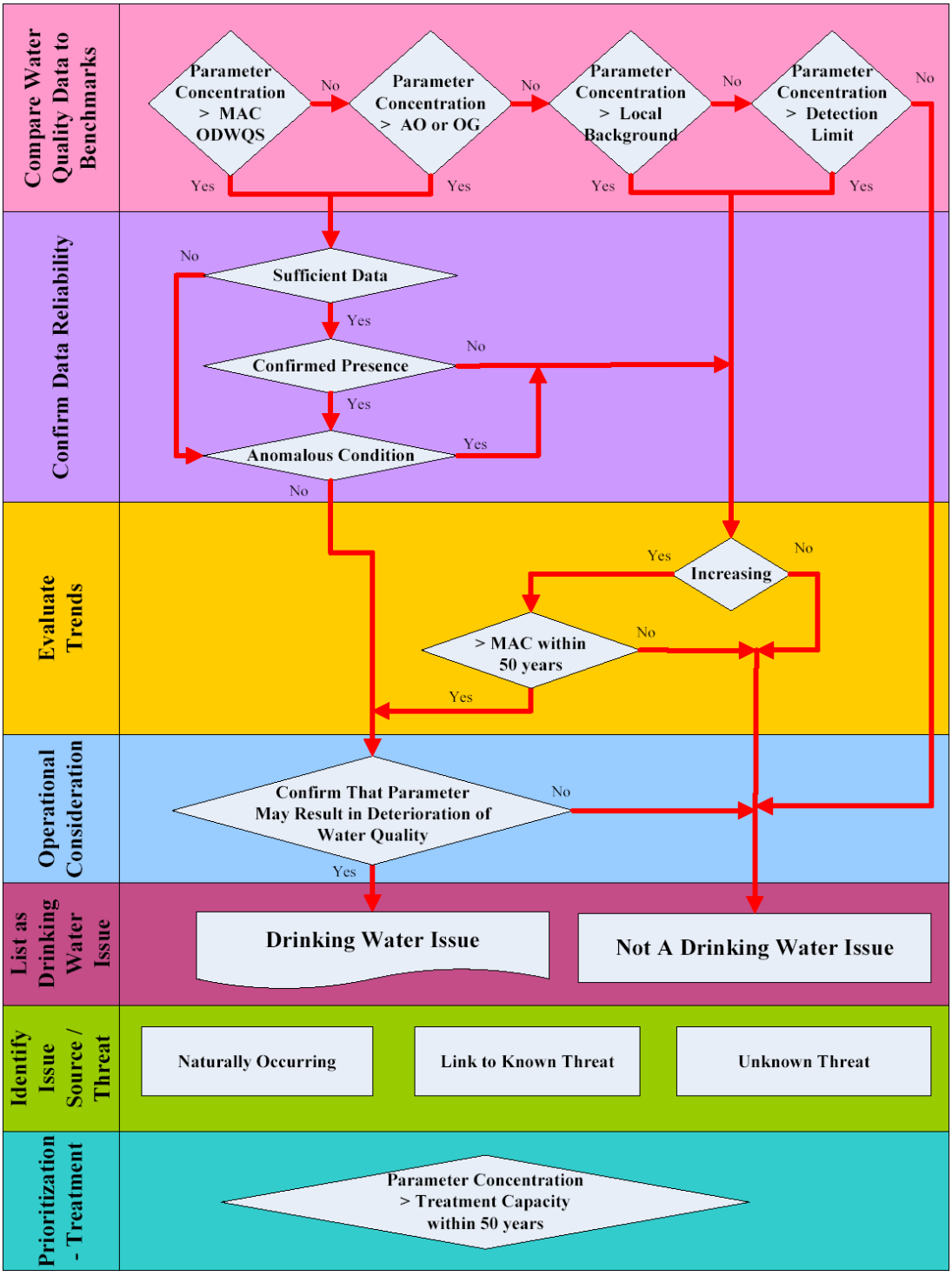


Figure 12: Methodology for Identifying Drinking Water Issues

Note the following acronym definitions in this figure: MAC = Maximum Acceptable Concentration, ODWQS = Ontario Drinking Water Quality Standards, AO = Aesthetic Objective, OG = Operational Guideline.

Issue Contributing Area

An issue contributing area is the area where drinking water threats may contribute to a known drinking water issue. An issue contributing area can occur within a WHPA, an IPZ, and may include a HVA, or a SGRA.

Within issue contributing areas, significant drinking water threats are present anywhere a circumstance for the identified issue is occurring, regardless of the vulnerability score stated to be required in the Tables of Threats or Circumstances.

Step 1: Review available data and reports for evidence that the concentration of a parameter is above the Ontario Drinking Water Quality Standards, or has an increasing trend that will lead to concentrations being above the standards. In this example, it has been determined that a nitrate-nitrogen issue exists.

Step 2: Identify the issue contributing area (Figure 13, Table 12). For this municipal drinking water supply system, the issue contributing areas represents the entire WHPA shown in red.

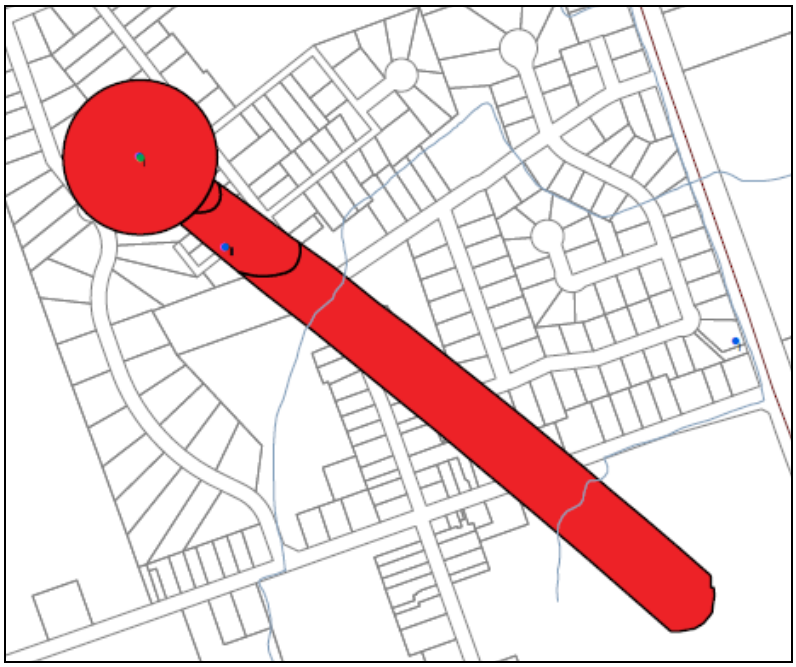


Figure 13: Issue Contributing Area of a Municipal Well

Table 12: Area Where Activities Are or Would Be Significant Drinking Water Threats

THREATS RELATED TO DRINKING WATER ISSUES	
Area	Significant
	Activities prescribed to be drinking water threats that can generate nitrate-nitrogen (NO_3 – N)
This table identifies the activities that are (or would be for future activities) significant drinking water threats within the issue contributing area.	

Step 3: Identify all significant threats within the issue contributing area that are associated with the issue. All circumstances associated with nitrate and nitrogen listed in the Provincial Tables of Threats and Circumstances would trigger the identification of a significant drinking water threat if the activity or condition is present or could be occurring anywhere within the issue contributing area, regardless of the vulnerability score within the different capture zones.

iii. Events Based Approach

The events based approach uses numerical modeling to identify potential significant threats and delineate the IPZ-3 for certain intakes. Through numerical modeling, spills of potential contaminants are simulated. This model calculates the probability of a spill reaching the intake at a concentration sufficient to trigger a threat by considering factors such as wind speed, water currents and flow rates.

Steps to Identify Significant Drinking Water Threats and IPZ-3 Delineation

Step 1: Select extreme events for threat identification and IPZ-3 delineation.

An analysis of wind speeds and river flows is undertaken to develop an extreme event scenario with a joint probability (considering both wind and flow) of approximately a 1-in-100-year storm event.

Step 2: Identify potential significant threats and assign spill scenarios.

Identify specific activities that may result in a contaminant being transported to the intake during an extreme event and the possible deterioration of the drinking water source. If an activity is considered to be a potential significant threat, spill scenarios are developed for the purposes of modeling transport to the intake.

Step 3: Model lake and tributary spills.

Calculate the dilution and reduction in spill concentrations in tributaries between the spill location and the tributary mouth by analytical means, during an extreme event.

Step 4: Identify significant threats and delineate IPZ-3.

Determine whether the spill constitutes a threat to the drinking water source at the intake through a comparison of modeled concentrations at the intake with the Ontario Drinking Water Quality Standard (ODWQS). Concentrations exceeding the ODWQS are typically considered to be a deterioration of the drinking water. If the identified activity is not within an existing IPZ (IPZ-1 or 2), an IPZ-3 is delineated based on the location of the significant threat activities.

Identifying the extent of the IPZ-3 and the associated significant threats is an iterative process. Upon review of step 3 and 4 results, revisit step 1 to ensure additional activities excluded in the first round are still no longer a threat. If the new modeling results indicate that an additional activity should be considered, proceed with steps 3 and 4.

iv. Conditions Based Approach

A condition represents the contamination of rock, soil, or water resulting from a past activity, such as a fuel spill. A condition must be within a vulnerable area (WHPA, IPZ, HVA, SGRA) and meet certain criteria as outlined in the Technical Rules to be considered a threat. Unless there is evidence that the condition is causing off-site contamination, the condition will not be considered a significant threat as prescribed by the Technical Rules and described in this section.

Criteria to Identify a Condition in the Technical Rules

1. The presence of a DNAPL in groundwater in a HVA, SGRA, or WHPA.
2. The presence of a single mass more than 100 litres of one or more DNAPLs in surface water in an IPZ.
3. The presence of a contaminant in groundwater in a HVA, SGRA, or WHPA, if the contaminant is listed in Table 2 of the Soil, Groundwater and Sediment Standards and is present at a concentration that exceeds the potable groundwater standard set out for the contaminant in that table.
4. The presence of a contaminant in surface soil in an IPZ, if the contaminant is listed in Table 4 of the Soil, Groundwater and Sediment Standards and is present at a concentration that exceeds the potable groundwater standard set out for the contaminant in that table.
5. The presence of a contaminant in sediment, if the contaminant is listed in Table 1 of the Soil, Groundwater and Sediment Standards and is present at a concentration that exceeds the sediment standard set out for the contaminant in that table.

Conditions are evaluated by calculating a risk score (Table 13).The risk score is calculated by multiplying the hazard rating by the vulnerability score of the vulnerable area in which the condition is located. The hazard rating is higher when there is evidence that the condition is causing offsite contamination or if the condition is on a property where a well, intake, or monitoring well related to a drinking water system is located. The Technical Rules specify that

where there is evidence that the condition is causing offsite contamination, or if the condition is on the same property as the drinking water system well, intake or monitoring well, the hazard rating is 10. In all other situations, the hazard rating is 6 (i.e. if the condition is and will remain contained within the site).

A condition may also be a significant drinking water threat if it is associated with a drinking water issue or if there is evidence that it is causing offsite contamination.

Table 13: Classification of Threat Levels for Drinking Water Conditions

Threat Level	Risk Score
Significant	≥ 80
Moderate	60 – 79
Low	41 – 59

Steps to Identify a Condition

Step 1: Review available data and reports for evidence that a past activity is causing contamination offsite. For this example, there is evidence of vinyl chloride contamination as a result of past activities.

Step 2: Identify the hazard score for the condition based on the Technical Rule criteria. For this example, it was determined that the hazard score associated with the vinyl chloride contamination is 10 because of evidence of offsite contamination.

Step 3: Identify the risk score of the condition. Recall that the risk score is equal to the vulnerability score multiplied by the hazard score and Table 14 identifies the areas where the condition would be significant, moderate and low.

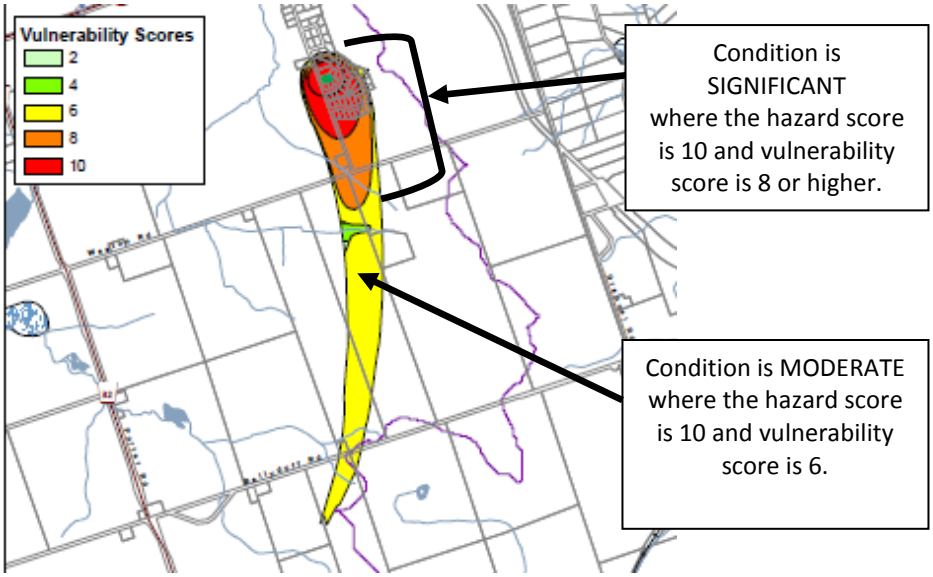


Figure 14: Location of a Condition to Be Classified as a Significant Threat

Table 14: Summary of the Impact of Conditions to Drinking Water Threats

Vulnerability Score	Evidence that the condition is causing offsite contamination and/or condition is on a property or well related to the drinking water system			All other situations		
	Hazard Score	Risk Score	Are or Would Be Conditions Risk	Hazard Score	Risk Score	Are or Would Be Conditions Risk
10	10	100	Significant	6	60	Moderate
8	10	80	Significant	6	48	Low
6	10	60	Moderate	6	36	Negligible Risk
4	10	40	Negligible Risk	6	24	Negligible Risk

v. Local Threats Based Approach

Source protection committees had the option to identify local threats as significant where permission was given by the Director of the Source Protection Programs Branch. To be designated as a local threat, three main criteria must be met:

1) The source protection committee identified the activity as a potential threat to a municipal drinking water source.
2) In the opinion of the Director, the chemical hazard rating of the activity is greater than 4, or the pathogen hazard rating of the activity is greater than 4.
3) The risk score for the activity in the vulnerable area is greater than 40, calculated as outlined in the Technical Rules.

Consult your local source protection plan to determine if your source protection committee was given permission to designate an activity as a local threat.

Appendix 1 provides an example of a local threat in the Otonabee-Peterborough Source Protection Region.

J. Putting It All Together- Steps for Identifying Threats and Applying Policies

This section pieces together the information provided to determine if significant drinking water threats are present on a property. The process of determining whether an activity is a significant drinking water threat can be broken into seven key steps (Table 15).

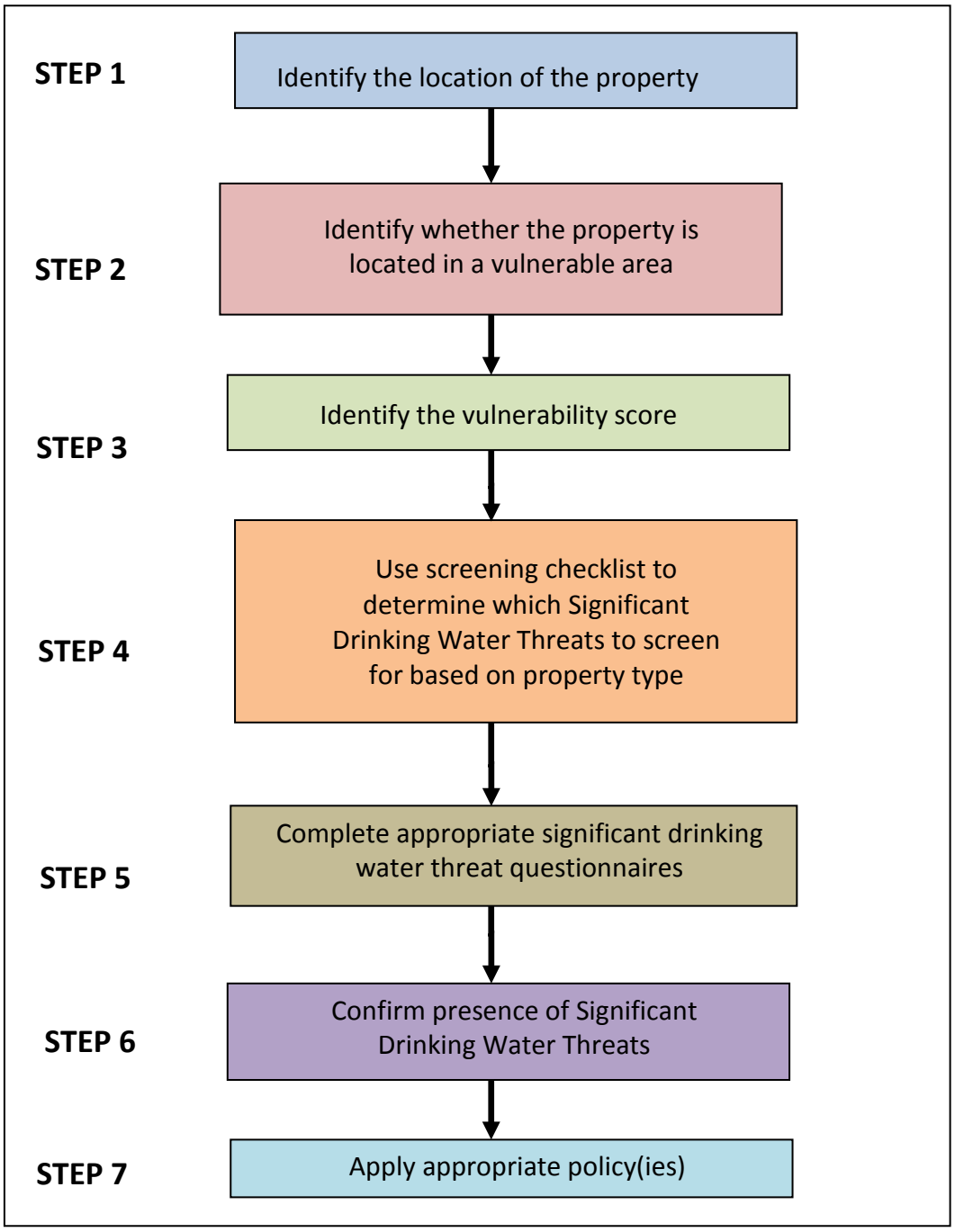


Figure 15: Steps in Identifying and Confirming Significant Drinking Water Threats

The first three steps in determining if significant drinking water threats are present onsite involve identifying the location of the property in question in relation to vulnerable area and vulnerability score. Once the property location has been determined, confirm that the property is located within a vulnerable area where significant drinking water threats are possible. Under the *Clean Water Act* significant drinking water threats are only found within WHPAs, IPZs or an issue contributing area, which may include HVAs or SGRAs.

Next, identify the vulnerability score. Within WHPAs and IPZs significant drinking water threats are possible anywhere the vulnerability score is 8 – 10, with the exception of the issue contributing area. Within the issue contributing area, significant drinking water threats are present anywhere a circumstance for the identified threat is met, regardless of the vulnerability score.

Once the property location, vulnerable area and vulnerability score have confirmed that the property is located in an area where significant drinking water threats are possible, identify the significant drinking water threats for which you want to screen. Figure 16 identifies threats commonly found on parcels of land based on the property type. The screening chart groups property types into four broad categories: agricultural, residential, industrial / commercial / institutional, and municipal. Not every property will fall into the four broad classes exclusively. For example, agricultural properties can have a residence and an ancillary commercial business also onsite. If this is the case, you may have to screen by vulnerable area and vulnerability score. Figures 17 and 18 provide quick reference as to what threats are possible depending on the vulnerable area (WHPA or IPZ) vulnerability score.

Once a list of threats to screen for has been narrowed down, the next step is to complete the appropriate significant drinking water threat questionnaires. Questionnaires for each of the 18 water quality drinking threats are located in Appendix 2. The questionnaires have been developed to obtain the information required to determine if a significant drinking water threat exists.

Once the individual threat questionnaires have been completed, the next step is to compare the respondent's answers with the Provincial Tables of Threats and/or the Provincial Tables of Circumstances to determine if a significant drinking water threat exists. Section 9 (I) describes how to use the Tables of Threats and Tables of Circumstances.

If the Tables of Threats and/or Circumstances confirm that a significant drinking water threat is present onsite, the last step is to apply the appropriate source protection plan policy. Contact your local source protection authority to obtain a copy.

Threat		Agricultural Operations	Residential Properties	Industrial, Commercial, Institutional	Municipal Lands
1a	Untreated septage	√			√
1b	Waste disposal sites				√
1c	Mine tailings			√	
2a	Stormwater management			√	√
2b	Wastewater treatment plants/sewer systems				√
2c	Onsite sewage systems		√	√	
2d	Industrial effluent			√	
3	Application of agricultural source material to land	√			
4	Storage of agricultural source material	√			
6	Application of non-agricultural source material	√			
7	Handling and storage of non-agricultural source material	√			
8	Application of commercial fertilizer to land	√	√	√	√
9	Handling and storage of commercial fertilizer	√		√	√
10	Application of pesticides to land	√		√	√
11	Handling and storage of pesticides	√		√	√
12	Application of road salt			√	√
13	Handling and storage of road salt			√	√
14	Storage of snow			√	√
15	Handling and storage of fuel	√	√	√	√
16	Handling and storage of DNAPLs		√	√	√
17	Handling and storage of organic solvents			√	√
18	Aircraft de-icing			√	
21	Livestock grazing, pasturing, outdoor confinement and farm-animal yards	√			

Figure 16: Screening Chart of Questionnaires to Complete by Property Type

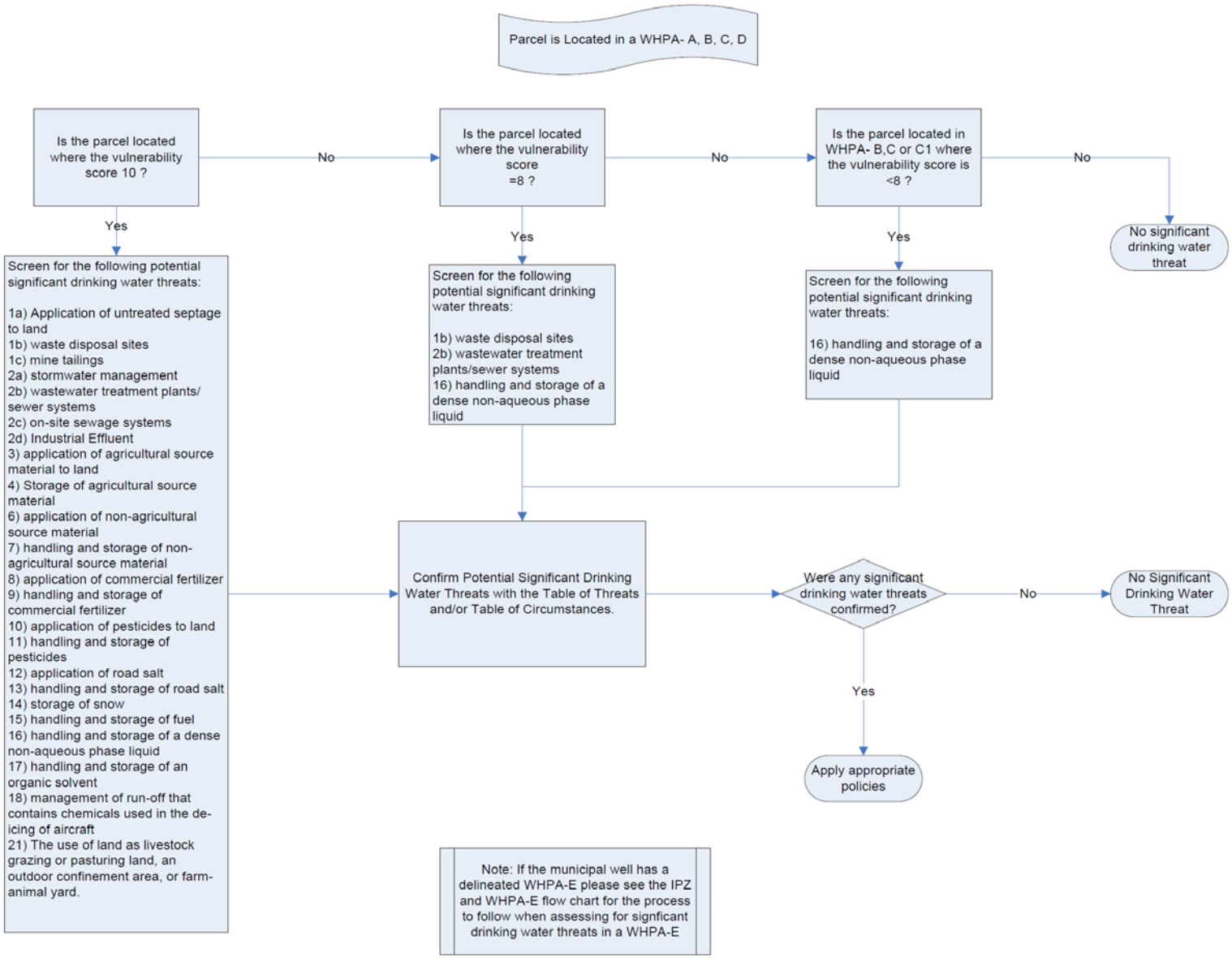


Figure 17: Flow Chart of Threats to Screen for Within a Wellhead Protection Area Based on Vulnerability Score

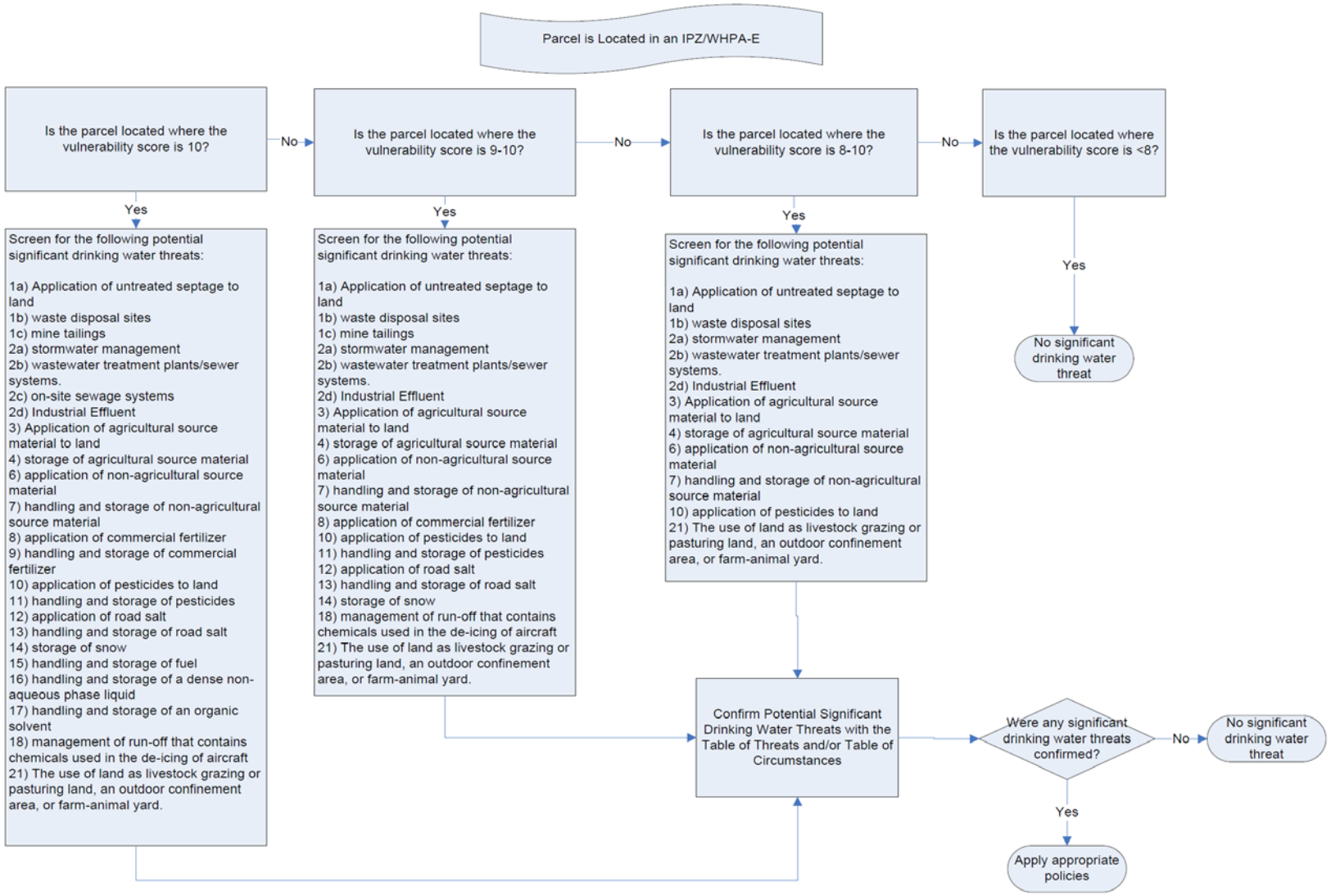


Figure 18: Flow Chart of Threats to Screen for Within IPZ/WHPA-E Based on Vulnerability Score

K. Case Study

You should now have an understanding of the three components (vulnerable areas, vulnerability score, and threat activities) necessary to determine whether an activity is a significant drinking water quality threat. You can make use of the Tables of Drinking Water Threats or Tables of Circumstances to complete the following fictional exercise.

Let's assume the Assessment Report indicates that an industrial property located at 123 Hall Street has the potential for several significant threats to drinking water. The Assessment Report further indicates that the two significant threat activities, which may be occurring are the handling and storage of an organic solvent (Threat #17), and the handling and storage of fuel (Threat #15).

This section of the module will work through the process of determining whether a significant drinking water threat is present for the fictional property located at 123 Hall Street.

Step 1: Identify the location of the property.

Locate the property using digital mapping software. Figure 19 shows the location of the property outlined in turquoise.

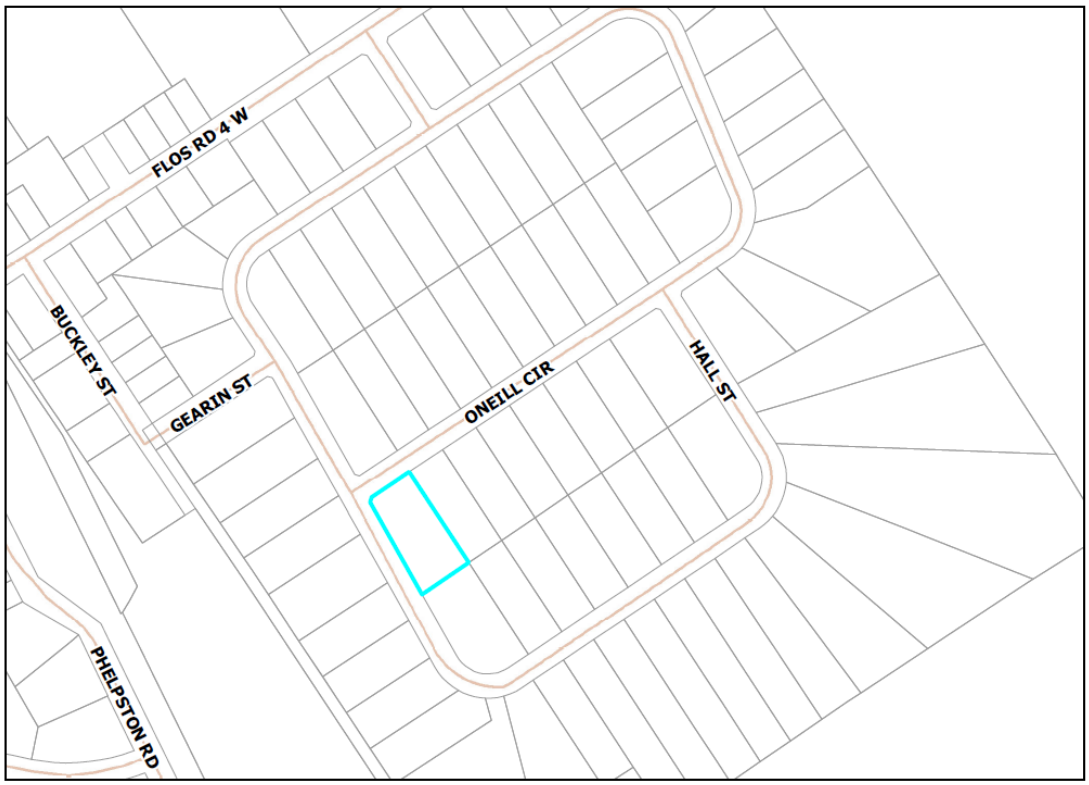


Figure 19: Case Study Property Location

Step 2: Identify the location of the property in relation to vulnerable areas.

Check whether the property is located within a vulnerable area where significant drinking water threats are possible (Figure 20).

The technical mapping provided within the Assessment Report indicates that the property is located within a municipal WHPA in capture zone WHPA-A. Digital copies of the technical mapping for your area may already have been or will be provided by your local source protection authority and will also be available through the Ministry of the Environment's Open Portal.

Figure 20: Property Location and Vulnerable Area Map

Step 3: Identify the vulnerability score.

Since the property in question is located within WHPA-A, the vulnerability score is 10 (Figure 21).

It is possible to have multiple vulnerability scores located on one property, as the property may be located in more than one vulnerable area (WHPA-A and B). If this is the case, additional screening efforts to identify the presence of a significant drinking water threat may be required.

Therefore, it will be important to note the location of the significant drinking water threat on the property. Use GPS coordinates to note the exact threat location.

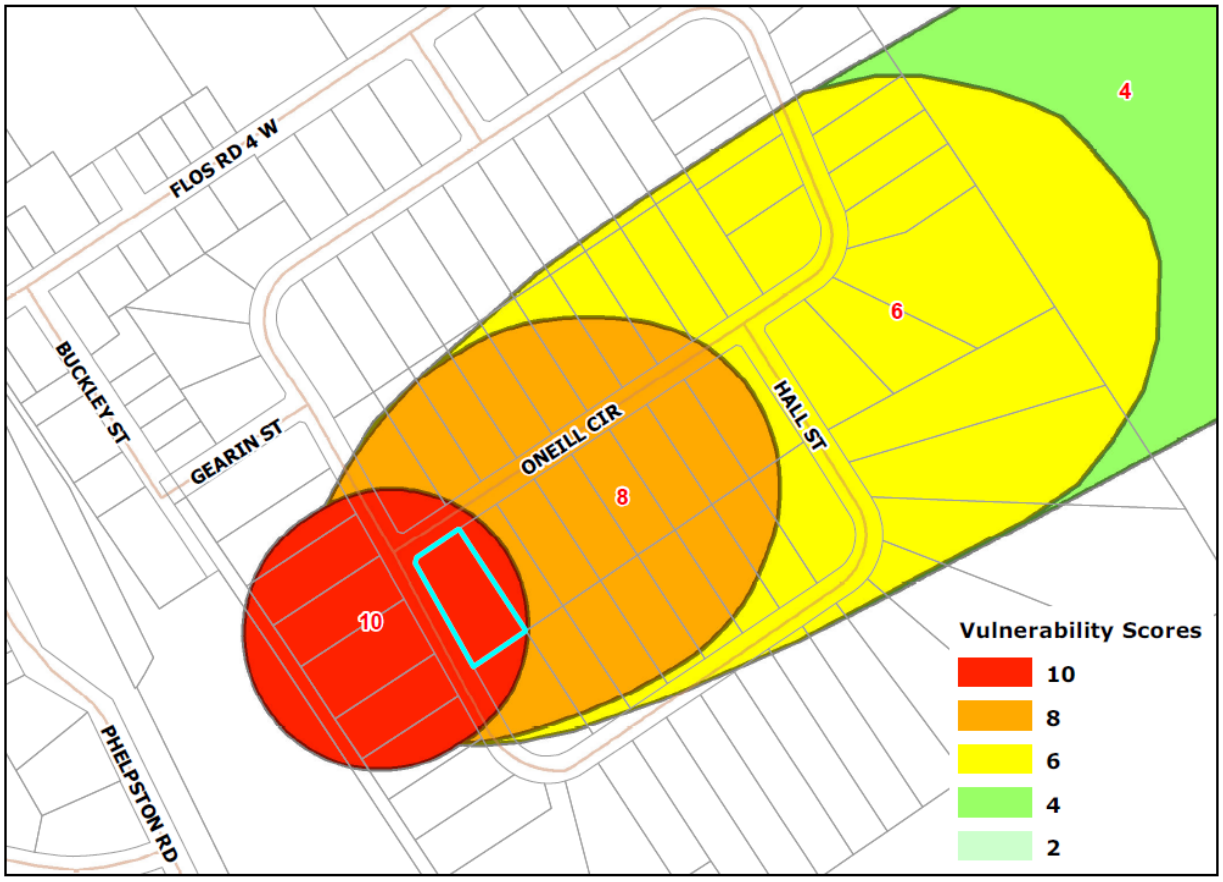


Figure 21: Property Location and Vulnerability Score Map

Step 4: Use the screening chart to determine which questionnaires to complete.

To complete this task you will need to use the significant drinking water threat screening chart (Figure 16). The screening chart identifies which threats are possible based on the property type where the activity is located. Figure 16 demonstrates that several potential significant drinking water threats are possible on an industrial property.

You now need to reference the WHPA flowchart (Figure 17) to determine which threats are possible on the property given the vulnerability score. Since the property is located where the vulnerability score is 10, all threats identified are possible significant threats and should be further investigated.

If multiple vulnerability scores are present on the property, you will need to know where the potential significant drinking water threat is located onsite relative to the vulnerability score. For example, if a fuel tank is located in a WHPA on a property where the vulnerability score is both 10 and 8, you will need to know the location of the fuel tank to proceed. Noting the

location of the threats by GPS coordinates will aid in the decision making process for identifying significant drinking water threats.

If the tank is located where the vulnerability score is 10, there is potential for the fuel tank to be significant drinking water threat, and you will need to complete the questionnaire to determine if the circumstances to be a significant drinking water threat are met. If the fuel tank is located where the vulnerability score is 8, it is not possible for the fuel tank to pose a significant drinking water threat, however it may be a moderate or low threat.

Step 5: Complete the appropriate significant drinking water threat questionnaires.

The basic information gathered from the Assessment Report database, as well as the vulnerability score of the area where the property is located, has confirmed which significant drinking water threats are possible. Since there is potential for all water quality threats to be significant on the property, all surveys in Appendix 2 must be completed. You will need to work with the landowner or tenant (whoever is undertaking the activity) to fill out these questionnaires. This information is used in conjunction with the Ministry of the Environment's Tables of Drinking Water Threats and the Tables of Circumstances to confirm the presence of a significant drinking water threat.

In this example, the completion of these surveys identifies that two significant drinking water threats are likely on the property; handling/storage of organic solvent, and handling/storage of fuel.

Step 6: Confirm the presence of significant drinking water threat(s).

To confirm whether the two activities taking place on the property are indeed significant drinking water threats, you need to refer to the Tables of Drinking Water Threats. The format of the Tables of Drinking Water Threats has already been described.

Review:

What you know:

1. the vulnerable area from Step 2
2. the vulnerability score from Step 3
3. information about the activity from Step 5

Using the feedback provided by the person engaging in the activity, you can confirm whether the circumstances described in Table 15 (Column 2) apply (circumstances for a significant threat related to the handling and storage of fuel).

Table 15: Excerpt from the Tables of Drinking Water Threats

Drinking Water Threats	Reference Number	Under the Following CIRCUMSTANCES	Areas Within Vulnerable Areas	Threat is Significant in Areas with a Vulnerability Score of	Threat is Moderate in Areas with a Vulnerability Score of	Threat is Low in Areas with a Vulnerability Score of
Column 1		**Column 2**	**Column 3**	**Column 4**	**Column 5**	**Column 6**
The handling and storage of fuel	197	1. The below grade handling of liquid fuel in relation to its storage at a bulk plant as defined in Section 1 of O. Reg. 217/01 (Liquid Fuels) made under the *Technical Standards and Safety Act, 2000,* or a facility that manufacturers or refines fuel. 2. The quantity of liquid fuel stored is more than 2,500 litres. 3. A spill of the fuel may result in the presence of BTEX in groundwater or surface water.	IPZ-1, IPZ-2, IPZ-3, and WHPA-E	10	7 - 9	4.8-6.4
			WHPA-A, WHPA-B, WHPA-C, WHPA-C1, WHPA-D	**10**	8	6
			HVA			6
			SGRA			6

Alternatively, you can simply refer to the Tables of Circumstances for chemicals in a WHPA with a vulnerability score of 10 (CW10S).

Table 16: Excerpt from Provincial Table of Circumstances

Provincial Table (CW10S): Chemicals in a WHPA with a vulnerability score of 10

The handling and storage of fuel

Ref #	Circumstances	Chemical
1359	1. The storage of liquid fuel in a tank below grade and at a facility as defined in Section 1 of O. Reg. 213/01 (Fuel Oil) made under the Technical Standards and Safety Act, 2000 or a facility as defined in Section BTEX 1 of O. Reg. 217/01 (Liquid Fuels) made under the Technical Standards and Safety Act, 2000, but not including a bulk plant. 2. The fuel is stored in a quantity that is more than 250, but not more than 2,500 litres.	BTEX
1360		Petroleum Hydrocarbons F1(nC6 – nC10)

Step 7: Apply appropriate policy or policies.

The Tables of Drinking Water Threats and the Tables of Circumstances have confirmed the Assessment Report threat enumeration – two significant drinking water threats are occurring on the property:

1. handling and storage of an organic solvent, due to a manufacturing process, and
2. handling and storage of fuel, due to the presence of a back-up power generator.

You should now reference your local source protection plan to confirm which policy(ies) apply to this property and then undertake the necessary steps to implement the policy(ies). The process of actual implementation of the policy(ies) is explained in future modules.

L. Appendix 1 - Detailed Local Threat Example

Congregation of Waterfowl Within or Near Surface Water Bodies

Table 17 provides an example of an activity, hazard rating and circumstances provided by the Director to determine when a local threat is considered significant. In this case, the threat is the congregation of waterfowl within or near surface water bodies in the Otonabee-Peterbrorough Source Protection Region.

Table 17: Example of a Local Threat in the Ontonabee-Peterborough Region

Activity	Hazard Rating	Circumstances that make the activity a drinking water threat
Maintaining open areas of mown grass for recreational activities that promote the congregation of waterfowl within or near surface water bodies (for Lakefield and Peterborough IPZs).	10	Congregation of waterfowl results in discharge of pathogens in surface water in an area where there are known drinking water quality impacts from waterfowl within an IPZ.

You will recall that a significant threat is determined through a combination of hazard rating and vulnerability score.

In this instance, the congregation of waterfowl within or near surface water bodies has been identified as a local threat with a hazard rating of 10. Therefore, anywhere the vulnerability score is equal to or greater than 8, the activity would be considered a significant threat (8 x 10 = 80). Figure 22 illustrates the locations of the vulnerable areas (red and orange areas).

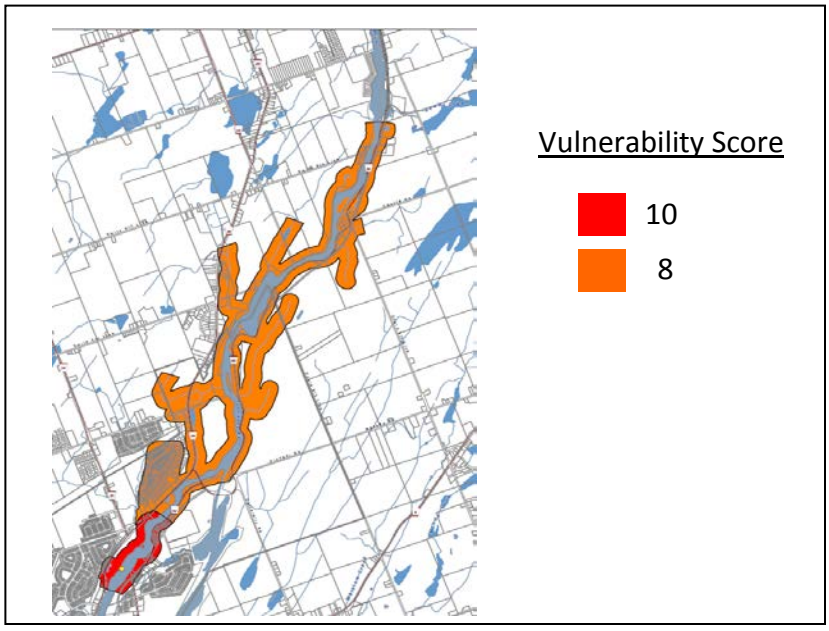


Figure 22: Locations Where Local Threat (Congregation of Waterfowl) Is or Would be Significant

M. Appendix 2 – Threat Screening Questionnaires

Threat 1a – Application of Untreated Septage to Land

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Application and Storage of Nutrients (Managed Lands)

1. Is untreated septage applied to land on the property?
   - ❑ Yes, please continue
   - ❑ No

2. What is the approximate land area on the property where the untreated septage is applied?
   - ❑ Less than 1 hectare
   - ❑ 1-10 hectares
   - ❑ More than 10 hectares

Unit Conversion Chart

Metric	Imperial
1 hectare	2.47 acres
10 hectares	24.71 acres
100 hectares	247.1 acres

Threat 1b – Waste Disposal Sites

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Waste Management

1. Is the property registered through Ontario's Hazardous Waste Information Network?
   - ❑ Yes, please provide the registry number if known: _____
   - ❑ No

2. Is the property registered as a waste receiver or waste generator through the MOE?
   - ❑ Yes, please provide the registry number if known: _____
   - ❑ No

3. Does the property have an MOE Environmental Compliance Approval/Certificate of Approval for waste storage or waste disposal?
   - ❑ Yes, please specify Environmental Compliance Approval/Certificate of Approval type and number (e.g. hazardous waste storage):
     _____
   - ❑ No

Land Disposal

4. Is the property currently used for any of the following? (check all that apply) Please answer the additional question if you check any of the boxes.
   - ❑ Land disposal of petroleum refining waste. If checked, what is the land/fill area?
     - ❑ Less than 1 hectare

- ❑ 1-10 hectares
- ❑ More than 10 hectares

❑ Land disposal of hazardous waste, liquid industrial waste, or processed liquid industrial waste. If checked, what is the land/fill area?
- ❑ Less than 1 heactare
- ❑ 1-10 hectares
- ❑ More than 10 hectares

❑ Land disposal of municipal waste. If checked, what is the land/fill area?
- ❑ Less than 1 heactare
- ❑ 1-10 hectares
- ❑ More than 10 hectares

❑ Land disposal of industrial or commercial waste. If checked, what is the land/fill area?
- ❑ Less than 1 heactare
- ❑ 1-10 hectares
- ❑ More than 10 hectares

5. Is the property used for land disposal of liquid industrial waste?
   - ❑ Yes
   - ❑ No, skip to next Section, PCB Waste

6. Are there injection wells for the disposal of liquid industrial waste on the property?
   - ❑ Yes
   - ❑ No, skip to next Section, PCB Waste

7. What is the combined injection rate of all injection wells on the property?
   - ❑ Less than 380 m^3/year
   - ❑ 380 – 3,799 m^3/year
   - ❑ 3,800 – 37, 999 m^3/year
   - ❑ 38, 000 – 379,999 m^3/year
   - ❑ 380,000 – 3,799,999 m^3/year
   - ❑ 3,800,000 to 37,999,999 m^3/year
   - ❑ More than 38, 000, 000 m^3/year

PCB Waste

8. Is the property used to store or dispose of PCB waste?
   - ❑ Yes
   - ❑ No, skip to next Section, Hazardous or Liquid Industrial Waste

9. How is the PCB waste stored?
   - ❑ In a facility or engineered cell below grade
   - ❑ In drums, located at or above grade
   - ❑ In a storage tank(s) located below grade
   - ❑ In a storage tank(s) located partially below grade
   - ❑ Outdoors, not in a container
   - ❑ Other
     a. Please specify container: _____
     b. Where is it stored? (Check all that apply)
        - ❑ Above grade
        - ❑ Below grade
        - ❑ Partially above and below grade

Hazardous or Liquid Industrial Waste

10. Are you subject to the *Toxics Reduction Act*?
    - ❑ Yes, please continue questionnaire
    - ❑ No, skip to question 12
    - ❑ Not sure

11. Do you have a Toxics Reduction Plan?
    - ❑ Yes
    - ❑ No
    - ❑ Not sure

12. Is hazardous waste or liquid industrial waste stored on the property?
    - ❑ Yes, please continue questionnaire
    - ❑ No, questionnaire has been completed.

13. Where is it stored? (check all that apply)
    - ❑ Above grade
    - ❑ Below grade
    - ❑ Partially above and below grade

14. Does the property store or handle small quantities of any of the following hazardous or liquid industrial wastes? (check all that apply) Please answer the additional questions if you check any of the boxes.

- ❑ Waste that is a hazardous industrial waste, hazardous waste chemical, ignitable waste, corrosive waste, leachate toxic waste or reactive waste and that is produced in any month in an amount less than 5 kilograms or otherwise accumulated in an amount less than 5 kilograms. If checked, where is the waste stored or handled? (check all that apply)
  - ❑ Above grade
  - ❑ Below grade
  - ❑ Partially above and below grade

  If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?
  - ❑ Yes
  - ❑ No
- ❑ Waste that is an acute hazardous waste chemical and that is produced in any month in an amount less than 1 kilogram or otherwise accumulated in an amount less than 1 kilogram. If checked, where is the waste stored or handled? (check all that apply)
  - ❑ Above grade
  - ❑ Below grade
  - ❑ Partially above and below grade

  If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?
  - ❑ Yes
  - ❑ No
- ❑ An empty container or the liner from an empty container that contained hazardous industrial waste, hazardous waste chemical, ignitable waste, corrosive waste, leachate toxic waste or reactive waste. If checked, where is the waste stored or handled? (check all that apply)
  - ❑ Above grade
  - ❑ Below grade
  - ❑ Partially above and below grade

  If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?
  - ❑ Yes
  - ❑ No
- ❑ An empty container of less than 20 litres capacity or 1 or more liners weighing, in total, less than 10 kilograms from empty containers, that contained acute hazardous waste chemical. If checked, where is the waste stored or handled? (check all that apply)
  - ❑ Above grade

- ❑ Below grade
- ❑ Partially above and below grade

If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?

- ❑ Yes
- ❑ No

❑ The residues or contaminated materials from the cleanup of a spill of less than 5 kilograms of waste that is a hazardous industrial waste, hazardous waste chemical, ignitable waste, corrosive waste, leachate toxic waste or reactive waste. If checked, where is the waste stored or handled? (check all that apply)

- ❑ Above grade
- ❑ Below grade
- ❑ Partially above and below grade

If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?

- ❑ Yes
- ❑ No

❑ The residues or contaminated materials from the cleanup of a spill of less than 1 kilogram of waste that is an acute hazardous waste chemical. If checked, where is the waste stored or handled? (check all that apply)

- ❑ Above grade
- ❑ Below grade
- ❑ Partially above and below grade

If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?

- ❑ Yes
- ❑ No

❑ Liquid industrial waste that is produced in any month in an amount less than 25 litres or otherwise accumulated in an amount less than 25 litres. If checked, where is the waste stored or handled? (check all that apply)

- ❑ Above grade
- ❑ Below grade
- ❑ Partially above and below grade

If checked, does the waste contain arsenic, cadmium, mercury, or chromium VI?

- ❑ Yes
- ❑ No

15. Is hazardous waste or liquid industrial waste stored on the property?

- ❑ Yes, please continue questionnaire
- ❑ No, questionnaire has been completed.

16. How many of each of the following types of wells are on the property? If you do not have a type of well please print 0.

Type of Well	# of Wells
Industrial Use Wells	
Unused Wells	
Irrigation Wells	
Dewatering wells	
Drinking Water Wells	
Geothermal Wells	
Monitoring Wells	
Drywell or Soakaway Pit	
Other:_____	
Other: _____	
Other: _____	

Unit Conversion Charts

Metric	Imperial
1 litre	0.22 gallons
25 litres	5.5 gallons
50 litres	11 gallons
250 litres	55 gallons
2500 litres	550 gallons

Metric	Imperial
1 hectare	2.47 acres
10 hectares	24.71 acres
100 hectares	247.1 acres

Threat 1c – Mine Tailings

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

1. Are tailings from mining operations stored on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No

2. How are the tailings typically stored on the property? (check all that apply)
   - ❑ In a pit
   - ❑ In an impoundment structure

3. Is the property required to report to the National Pollutant Release Inventory?
   - ❑ Yes
   - ❑ No

Threat 2a – Stormwater Management

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Stormwater

1. Does the property have a stormwater management facility?
   - ❑ Yes, please continue questionnaire
   - ❑ No

2. What is the drainage area serviced by the facility?
   - ❑ Less than 1 hectare
   - ❑ 1 to 9 hectares
   - ❑ 10 to 100 hectares
   - ❑ More than 100 hectares

Unit Conversion Charts

Metric	Imperial
1 hectare	2.47 acres
10 hectares	24.71 acres
100 hectares	247.10 acres

Threat 2b – Waste water Treatment Plants/Sewer Systems

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Sanitary Sewage

The following questions ask about sanitary sewage systems. Note that if more than one system (of the same type) is present on the property, you need to fill in the combined capacity of all systems.

1. Does the property have a privately-owned or operated sewage system that discharges untreated or partially treated sewage into the municipal sanitary sewer, or that is not connected to the municipal sewer system? Note that this includes sewage holding tanks or treatment tanks, but does not include plumbing features such as toilets or pipes.
   - ❑ Yes, please continue questionnaire
   - ❑ No, skip to question 4

2. Does the system include a designed bypass to divert extra flow due to higher volume/higher flow events?
   - ❑ Yes
   - ❑ No

   Designed bypass means an intentional diversion of wastewater from the wastewater system, from any portion of a pre-treatment facility prior to completing pre-treatment, or from any industrial process or other source of wastewater prior to pre-treatment (i.e. during periods of high volume, some wastewater may bypass the wastewater treatment and flow directly to the sewer system, sewer or surface water).

3. What is the designed conveyance capacity of the sewage system?
   - ❑ Less than 250 m^3/day

- ❑ 250 – 999 m^3/day
- ❑ 1,000 – 9,999 m^3/day
- ❑ 10,000 – 100,000 m^3/day
- ❑ More than 100,000 m^3/day

4. Does the system have a wastewater treatment tank or storage tank?
   - ❑ Yes, treatment tank
   - ❑ Yes, storage tank
   - ❑ No, fill out the On-Site Sewage Systems questionnaire

5. What is the designed capacity of the tank? Note: if more than one tank is present indicate the total capacity of all tanks.
   - ❑ Less than 500 m^3/day
   - ❑ 2,050 – 2,499 m^3/day
   - ❑ 2,500 – 17,499 m^3/day
   - ❑ 17,500 – 50,000 m^3/day
   - ❑ More than 50,000 m^3/day

6. Does the tank(s) service more than 1 property?
   - ❑ Yes
   - ❑ No

7. The tank(s) is: (check all that apply)
   - ❑ Above grade
   - ❑ Below grade
   - ❑ Partially above and below grade

Threat 2c – On-site Sewage Systems

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

1. Does the property have a septic system, outhouse, earth-pit privy, privy vault, greywater system, cesspool, or leaching bed systems?
   - ❑ Yes
   - ❑ No

2. Does the property have a sewage system that uses a holding tank for hauled sewage?
   - ❑ Yes
   - ❑ No

7. What is the capacity of the system? If you have more than 1 system on the property, indicate the total combined capacity of all systems.
   - ❑ Less than 10,000 L/day
   - ❑ More than 10,000 L/day

8. Is the system servicing more than one property?
   - ❑ Yes
   - ❑ No

Unit Conversion Chart

Metric	Imperial
1 litre	0.22 gallons
25 litres	5.5 gallons
50 litres	11 gallons
250 litres	55 gallons
2500 litres	550 gallons

Threat 2d – Industrial Effluent

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

1. Does the property have an on-site industrial sewage system?
   - ❑ Yes, please continue questionnaire
   - ❑ No

2. Does the system discharge to surface water?
   - ❑ Yes
   - ❑ No

3. Is the property required to report to the National Pollutant Release Inventory?
   - ❑ Yes
   - ❑ No

4. Please list the chemicals discharged to surface water.

   _____
   _____
   _____

Threats 3, 4 and 5 – Agricultural Source Material

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Application, Handling and Storage of Agricultural Source Material (Manure)
This Section asks about application, handling and storage of manure (liquid or solid) on the property. The Source Water Protection program refers to manure as Agricultural Source Material (ASM).

1. Is manure applied to land on the property?
   - ❑ Yes, please state to what percentage of the property it is applied _____%
   - ❑ No

2. What is the approximate land area where agricultural source materials were applied on the property in the last year?
   - ❑ Less than 1 hectare
   - ❑ 1 – 9.9 hectares
   - ❑ 10 – 100 hectares
   - ❑ More than 100 hectares

3. Is manure stored on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No, skip to question 5

4. How is the manure typically stored? (check all that apply)
   - ❑ Permanent nutrient storage facility located at or above grade
   - ❑ Permanent nutrient storage facility located partially below grade
   - ❑ Permanent nutrient storage facility located below grade
   - ❑ Temporary field nutrient storage site located at or above grade

- ❑ Temporary field nutrient storage site located below grade

5. Is any part of the property currently used for aquaculture?
   - ❑ Yes
   - ❑ No

Unit Conversion Charts

Metric	Imperial
1 litres	0.26 gallons
25 litres	6.6 gallons
50 litres	13 gallons
250 litres	66.04 gallons
2500 litres	660.4 gallons

Metric	Imperial
1 hectare	2.47 acres
10 hectares	24.71 acres
100 hectares	247.1 acres

Threats 6 & 7 – Non Agricultural Source Material (NASM)

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Application, Handling and Storage of NASM

This questionnaire asks about Non-Agricultural Source Material (NASM) that may be on your property. NASM refers to biosolids from outside sources, including sewage treatment facilities, pulp and paper mills, and food processing operations.

1. Is non-agricultural source material applied to land on the property?
   - ❑ Yes, please state to what percentage of the property it is applied _____%
   - ❑ No

2. What is the approximate land area where non- agricultural source materials were applied on the property in the last year?
   - ❑ Less than 1 hectare
   - ❑ 1 – 9.9 hectares
   - ❑ 10 – 100 hectares
   - ❑ More than 100 hectares

3. If nutrients are applied to less than 100% of the property, please give a brief description of the areas to which nutrients are NOT applied:_____
   _____
   _____

Application, Handling and Storage of NASM

5. In the last 10 years, was any NASM stored on the property?
   - ❑ Yes, please continue questionnaire

- ❑ No

6. How is the NASM typically stored? (check all that apply)
   - ❑ Permanent nutrient storage facility located at or above grade
   - ❑ Permanent nutrient storage facility located partially below grade
   - ❑ Permanent nutrient storage facility located below grade
   - ❑ Temporary field nutrient storage site located at or above grade
   - ❑ Temporary field nutrient storage site located below grade

7. How much nitrogen is typically contained in the stored NASM?
   - ❑ Less than 0.5 tonnes
   - ❑ 0.5 - 5 tonnes
   - ❑ More than 5 tonnes
   - ❑ Unknown

8. Do you have a NASM Plan?
   - ❑ Yes, please provide the Reference number_____
   - ❑ No

Threats 8 & 9 – Commercial Fertilizer

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Application of Commercial Fertilizer

1. Is commercial fertilizer applied to land on the property?
   - ❑ Yes, applied by outsourced contractor. Please state to what percentage of the property it is applied _____%
   - ❑ Yes, applied by property owner/tenant. Please state to what percentage of the property it is applied _____%
   - ❑ No

Handling and Storage of Commercial Fertilizer

2. Is commercial fertilizer stored on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No

3. What is the purpose of fertilizer stored on the property? (check all that apply) Please answer the additional questions if you check any of the boxes.
   - ❑ Stored for use on the property? If checked, what is the quantity of fertilizer stored on the property?
     - ❑ Less than 25 kg
     - ❑ 25-249 kg
     - ❑ 250-2,500 kg
     - ❑ More than 2,500 kg

- ❑ Sold wholesale on the property? If checked, what is the quantity of fertilizer stored on the property?
  - ❑ Less than 25 kg
  - ❑ 25-249 kg
  - ❑ 250-2,500 kg
  - ❑ More than 2,500 kg
- ❑ Sold for retail on the property? If checked, what is the quantity of fertilizer stored on the property?
  - ❑ Less than 25 kg
  - ❑ 25-249 kg
  - ❑ 250-2,500 kg
  - ❑ More than 2,500 kg
- ❑ Manufactured and/or processed on the property? If checked, what is the quantity of fertilizer stored on the property?
  - ❑ Less than 25 kg
  - ❑ 25-249 kg
  - ❑ 250-2,500 kg
  - ❑ More than 2,500 kg

4. What is the typical nitrogen content in the fertilizer?
   - ❑ Less than 5%
   - ❑ 5 – 25%
   - ❑ More than 25%

5. What is the typical phosphorus content in the fertilizer?
   - ❑ Less than 5%
   - ❑ 5 – 25%
   - ❑ More than 25%

Unit Conversion Chart

Kilograms	Pounds
1 kilogram	2.20 pounds
25 kilograms	55.1 pounds
250 kilograms	551.1 pounds
2500 kilograms	5511.55 pounds

Threats 10 & 11 – Pesticides

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Application, Handling and Storage of Pesticides

1. In the past year, were pesticides applied to land on the property?
   - ❑ Yes, applied by outsourced contractor
   - ❑ Yes, applied by property owner/tenant
   - ❑ No, skip to question 4

2. What is the approximate land area where pesticides were applied on the property in the past year?
   - ❑ Less than 1 hectare
   - ❑ 1 – 9.9 hectares
   - ❑ 10 – 100 hectares
   - ❑ More than 100 hectares

3. Does the pesticide applied on the property contain any of the following ingredients? (check all that apply)
   - ❑ Atrazine
   - ❑ Dicamba
   - ❑ Dichlorophenoxy Acetic Acid (2,4-D)
   - ❑ Dichloropropene-1,3
   - ❑ Glyphosate
   - ❑ Atrazine
   - ❑ MCPA (2-methyl-4-chlorophenoxy acetic acid)
   - ❑ Mecoprop

- ❑ Metalaxyl
- ❑ Metolachlor or s-Metolachlor
- ❑ Pendimethalin
- ❑ MCPB (2-methylphenoxy) butanoic acid
- ❑ Other_____
- ❑ Unknown
- ❑ None of these

4. Are pesticides stored on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No

5. What is the purpose of pesticide storage on the property? (check all that apply)
   - ❑ Pesticides are stored for use on the property
   - ❑ Pesticides are sold for retail on the property
   - ❑ Pesticides are sold wholesale on the property
   - ❑ Pesticides are manufactured/processed on the property

6. Does the pesticide stored on the property contain any of the following ingredients? (check all that apply)
   - ❑ Atrazine
   - ❑ Dicamba
   - ❑ Dichlorophenoxy Acetic Acid (2,4-D)
   - ❑ Dichloropropene-1,3
   - ❑ Glyphosate
   - ❑ Atrazine
   - ❑ MCPA (2-methyl-4-chlorophenoxy acetic acid)
   - ❑ Mecoprop
   - ❑ Metalaxyl
   - ❑ Metolachlor or s-Metolachlor
   - ❑ Pendimethalin
   - ❑ MCPB (2-methylphenoxy) butanoic acid
   - ❑ Other_____
   - ❑ Unknown
   - ❑ None of these

Unit Conversion Chart

Metric	US Standard Units
1 hectare	2.47 acres
10 hectares	24.71 acres
100 hectares	247.1 acres

Threats 12 & 13 – Road Salt

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Road Salt and Winter Salt Storage and Application

1. Do you use any salt for de-icing on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No, skip to question 4

2. How much salt is applied in a typical year?
   - ❑ Less than 25 kilograms
   - ❑ 25-99 kilograms
   - ❑ 100-250 kilograms
   - ❑ More than 250 kilograms

3. Is the salt managed by an outside hired contractor or company?
   - ❑ Yes
   - ❑ No

4. Are any alternative salt application practices used? (check all that apply)
   - ❑ Anti-icing liquid
   - ❑ Pre-wetting (e.g. beet juice)
   - ❑ Reduced chloride
   - ❑ Pickled sand
   - ❑ Chloride-free products (e.g. Calcium Magnesium Acetate)
   - ❑ Other, please specify_____

- ❑ None

5. Do you store salt for de-icing on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No

6. What quantity of salt is stored?
   - ❑ Less than 500 tonnes
   - ❑ 500 5,000 tonnes
   - ❑ More than 5,000 tonnes

7. How is the salt stored? (check all that apply)
   - ❑ In a manner that allows exposure to precipitation, or runoff from precipitation or snow melt
   - ❑ In a salt dome or other facility to prevent exposure to runoff and precipitation
   - ❑ In manufacturer's package, indoors (e.g., garage or shed)

Unit Conversion Chart

Kilograms	Pounds
1 kilogram	2.20 pounds
25 kilograms	55.1 pounds
250 kilograms	551.1 pounds
2500 kilograms	5511.55 pounds

Threat 14 – Storage of Snow

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Snow Storage

1. Is any part of the property used to store snow collected from roads or other paved areas located on a different property?
   - ❑ Yes, from public roads, please continue questionnaire
   - ❑ Yes, from private properties, please continue questionnaire
   - ❑ Yes, from public roads and private properties, please continue questionnaire
   - ❑ No

2. What is the approximate land area on the property used to store the snow?
   - ❑ Less than 0.01 hectares
   - ❑ 0.01 – 0.5 hectares
   - ❑ 0.5 – 0.9 hectares
   - ❑ 1 – 5 hectares
   - ❑ More than 5 hectares

3. Where is the snow stored?
   - ❑ Above grade
   - ❑ Below grade (e.g. in a pit or quarry)
   - ❑ Both

Unit Conversion Chart

Metric	US Standard Units
1 hectare	2.47 acres
10 hectares	24.71 acres
100 hectares	247.1 acres

Threat 15 – Handling and Storage of Fuel

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

1. Are any of the following types of liquid fuel used or stored on the property? (check all that apply) Please answer the additional questions if you check any of the boxes.
   - ❑ Gasoline. What is the maximum quantity of fuel stored on the property at any one time? (check only one)
     - ❑ Less than 25 litres (e.g. Jerry can)
     - ❑ 25-249 litres (up to 1 drum)
     - ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
     - ❑ More than 2,500 litres (more than 1 tank)

     How is the fuel stored? (Check all that apply)
     - ❑ Above ground tank
     - ❑ Underground tank (includes basement tanks)
     - ❑ Portable container
   - ❑ Diesel. What is the maximum quantity of fuel stored on the property at any one time? (check only one)
     - ❑ Less than 25 litres (e.g. Jerry can)
     - ❑ 25-249 litres (up to 1 drum)
     - ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
     - ❑ More than 2,500 litres (more than 1 tank)

     How is the fuel stored? (Check all that apply)
     - ❑ Above ground tank
     - ❑ Underground tank (includes basement tanks)
     - ❑ Portable container
   - ❑ Heating oil/fuel oil. What is the maximum quantity of fuel stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

How is the fuel stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Used oil/waste oil. What is the maximum quantity of fuel stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

How is the fuel stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Other (please specify) _____. What is the maximum quantity of fuel stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

How is the fuel stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

Unit Conversion Chart

Metric	Imperial
1 litre	0.22 gallons
25 litres	5.5 gallons
50 litres	11 gallons
250 litres	55 gallons
2500 litres	550 gallons

Threat 16 – Handling and storage of Dense Non Aqueous Phase Liquids (DNAPLs)

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Chemical Storage and Handling

1. Are any of the following chemical products used or stored on the property? (check all that apply) Please answer the additional three questions if you check any of the boxes.
   - ❑ Degreasers (e.g. acetone, methyl hydrate) not containing chlorinated solvents. What is the maximum quantity of chemical products stored on the property at any one time? (check only one)
     - ❑ Less than 25 litres (e.g. Jerry can)
     - ❑ 25-249 litres (up to 1 drum)
     - ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
     - ❑ More than 2,500 litres (more than 1 tank)

     Please print the trade name or chemical name of the product used **most often** in this category: _____

     How are the chemical products stored? (Check all that apply)
     - ❑ Above ground tank
     - ❑ Underground tank (includes basement tanks)
     - ❑ Portable container
   - ❑ Paints/paint thinners (e.g. Varsol, Turpentine). What is the maximum quantity of chemical products stored on the property at any one time? (check only one)
     - ❑ Less than 25 litres (e.g. Jerry can)
     - ❑ 25-249 litres (up to 1 drum)
     - ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
     - ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Enamels/lacquers (e.g. Varathane, Hydrocote). What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Adhesives/glues (e.g. Epoxy, Polyurethane). What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Resins (e.g. PVC Resin, Urea Formaldehyde). What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)

- ❑ Portable container

❑ Furniture strippers (e.g. Acetone, Toluene, Turpentine). What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Chlorinated solvents (e.g. Trichloroethylene (TCE), Perchloroethylene (PCE)). What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ PCB liquids or fluids. What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Creosote. What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

❑ Other (please specify chemical name) _____.

What is the maximum quantity of chemical products stored on the property at any one time? (check only one)

- ❑ Less than 25 litres (e.g. Jerry can)
- ❑ 25-249 litres (up to 1 drum)
- ❑ 250-2,500 litres (at least 1 drum, up to 1 tank)
- ❑ More than 2,500 litres (more than 1 tank)

Please print the trade name or chemical name of the product used **most often** in this category: _____

How are the chemical products stored? (Check all that apply)

- ❑ Above ground tank
- ❑ Underground tank (includes basement tanks)
- ❑ Portable container

Unit Conversion Chart

Metric	Imperial
1 litre	0.22 gallons
25 litres	5.5 gallons
50 litres	11 gallons
250 litres	55 gallons
2500 litres	550 gallons

Threat 17 – Handling and Storage of Organic Solvents

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Note: Please see the end of questionnaire for a unit conversion chart.

Chemical Storage, Handling and Disposal

1. Do you store or handle organic solvents on the property?
   - ❑ Yes, please continue questionnaire
   - ❑ No

2. Do you store or handle more than 25 litres of the following organic solvents on the property:
   - Wood preservative such as creosote or CCA?
   - Paint stripper / degreaser
   - Cleaning agent/ refrigerant
   - Chloroform (historically used as an anesthetic, now as dyes, cleaning agent)

   ❑ Yes, please state how much is stored_____(litres)
   ❑ No
   ❑ Unsure

Threat 18 – Aircraft De-icing

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Management of Runoff that Contains Chemicals used in the De-icing of Aircraft

1. Is the airport classified as:
   - ❑ Remote
   - ❑ Small
   - ❑ Regional-continue

2. Is there an opportunity for run-off containing de-icing materials to discharge to land or water?
   - ❑ Yes
   - ❑ No

Threat 21 – Livestock

Contact Information

Contact Name for Property:	
Property Owner:	
Property Address:	
Phone Number:	
Roll Number:	
E-mail:	

Use of Land as Livestock, Grazing or Pasturing; an Outdoor Confinement Area; or a Farm Animal Yard

1. Are livestock and/or poultry raised on the property?
   - ❑ Yes, please fill in the table below
   - ❑ No, skip to question 2

   Please indicate the total number of each type of livestock and/or poultry on the property.

Type of Livestock	# of Livestock
Beef cattle	
Horses	
Sheep	
Ducks	
Dairy cattle	
Chicken	
Turkeys	
Goats	
Swine	
Other: _____	
Other: _____	

2. What is the total percentage of the property that is used for livestock grazing, pasture lands and outdoor confinement? _____%