



DRINKING WATER SOURCE PROTECTION

ACT FOR CLEAN WATER

Drinking Water Quality Threats and Issues Training

Guidance on Regulation and Director's Technical Rules for
the development of the Assessment Report



DRINKING WATER SOURCE PROTECTION

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Presentation Outline

Process Overview

- Delineation of Vulnerable Areas
- Vulnerability Scoring
- Drinking Water Quality Threats – 3 Approaches
 - Threats Approach
 - Issues Approach
 - Event based Approach
- Enumerating Significant Drinking Water Threats

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

Type of Drinking Water System in your SPA			Possible Approaches		
			Threats Approach	Issues Approach	Event Based Approach
Groundwater only			√	√	-
Type A and B Intakes and type C and D intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River	IPZ-1 and IPZ-2 Delineated	Threat modeling completed for IPZ-3	√	√	√
		Threat modeling not completed for IPZ-3	√	√	-
Type C and D intakes excluding intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River			√	√	-



Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Type C and D intakes excluding intakes on Lake Nipissing, Lake Simcoe, Lake St. Clair or the Ottawa River			√	√	-



Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 3

Overview

3. Drinking Water Threats: Water Quality

What Is a Threat?

Drinking Water Threat: 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, and includes an activity or condition that is prescribed by the Regulations as a drinking water threat.

What Is An Activity?

What Is a Condition?

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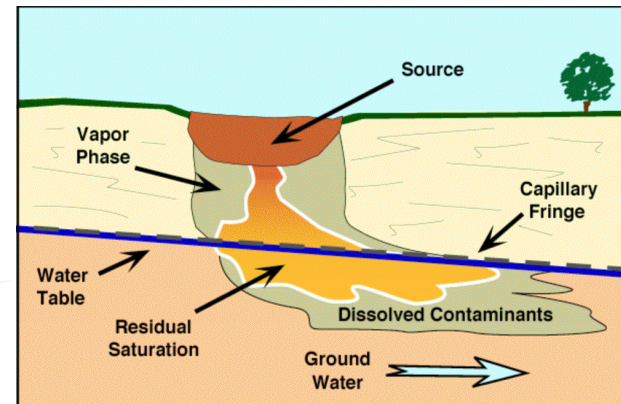
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What Is a Threat?

Examples of Activities –
storage, application, discharge



Examples of Conditions –
contaminated sediment, groundwater plume



Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 3

3A. Threats Approach

1. Listing Drinking Water Threats

For Each Vulnerable area:

- i. List the Prescribed Drinking Water Threats

List of Prescribed Drinking Water Threats

The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act.

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

The application of agricultural source material to land.
The storage of agricultural source material.
The management of agricultural source material.

The application of pesticide to land.
The handling and storage of pesticide.

The application of commercial fertilizer to land.
The handling and storage of commercial fertilizer.

The handling and storage of non-agricultural source material.
The application of non agricultural source material to land

The handling and storage of an organic solvent

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

The handling and storage of fuel.

The storage of snow.

The application of road salt.
The handling and storage of road salt.

The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard

The management of runoff that contains chemicals used in the de-icing of aircraft.

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.

An activity that reduces the recharge of an aquifer.

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3A. Threats Approach

1. Listing Drinking Water Threats

For Each Vulnerable area:

- i. List the Prescribed Drinking Water Threats
- ii. List any local threats added by the SPC with Director approval

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Step 3

3A. Threats Approach

1. Listing Drinking Water Threats

For Each Vulnerable area:

- i. List the Prescribed Drinking Water Threats
- ii. List any local threats added by the SPC with Director approval
- iii. List any conditions identified within each vulnerable area

2. Listing Circumstances

For each list produced for your vulnerable areas

- identify the circumstances under which activities in the threat lists are:
 - Significant,
 - Moderate, or
 - Low drinking water threats

Refinement of lists to be specific to each vulnerable area

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Step 3

3A. Threats Approach

3. Areas Where Threats are S/M/L

Maps will be produced for each vulnerable area

- Illustrating the delineated zones and the respective vulnerability scores

The maps and specific vulnerability scoring will have corresponding lists of Significant, Moderate, and Low drinking water threats, as produced in the previous step (number 2: List Circumstances)

Linking Your Tables of Threats and Circumstances to Areas

Exported from Tables tool....

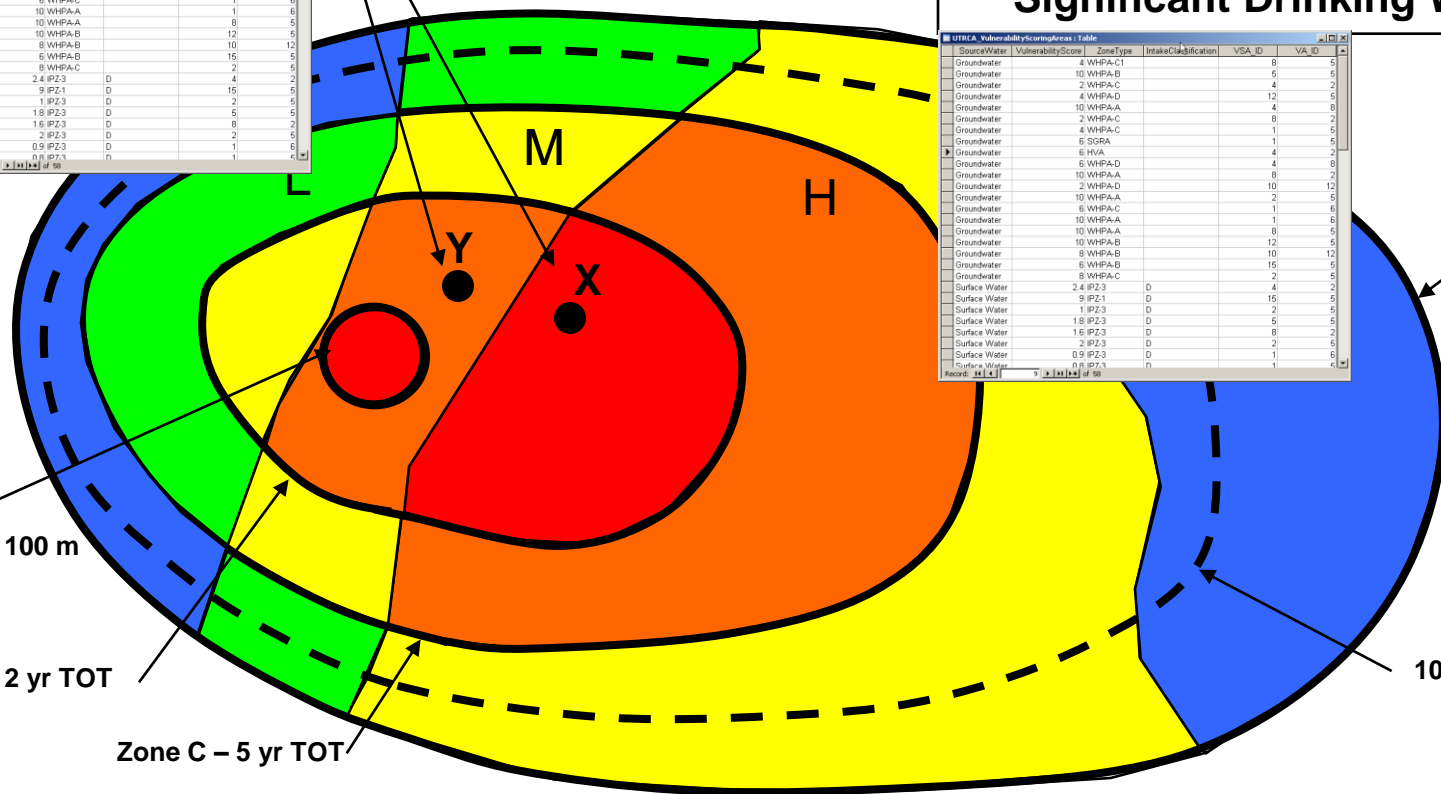
Significant Drinking Water Threat X in Vulnerability 10

Moderate Drinking Water Threat Y in Vulnerability 8

SourceWater	VulnerabilityScore	ZoneType	IntakeClassification	VSA_ID	VA_ID
Groundwater	4	WHPA-C1		9	5
Groundwater	10	WHPA-B		5	5
Groundwater	2	WHPA-C		4	2
Groundwater	4	WHPA-D		12	5
Groundwater	10	WHPA-A		4	8
Groundwater	2	WHPA-C		8	2
Groundwater	4	WHPA-C		1	5
Groundwater	6	SSRA		3	5
Groundwater	6	HVA		4	2
Groundwater	6	WHPA-D		4	8
Groundwater	10	WHPA-A		8	2
Groundwater	2	WHPA-D		10	12
Groundwater	10	WHPA-A		2	5
Groundwater	6	WHPA-C		1	6
Groundwater	10	WHPA-A		3	6
Groundwater	10	WHPA-A		8	5
Groundwater	10	WHPA-B		12	5
Groundwater	6	WHPA-B		10	12
Groundwater	6	WHPA-B		15	5
Groundwater	8	WHPA-C		2	5
Surface Water	2	IP2-3	D	4	2
Surface Water	9	IP2-1	D	15	5
Surface Water	1	IP2-3	D	2	5
Surface Water	1.8	IP2-3	D	5	5
Surface Water	1.6	IP2-3	D	8	2
Surface Water	2	IP2-3	D	2	5
Surface Water	0.9	IP2-3	D	1	6
Surface Water	0.9	IP2-1	n	1	4

SourceWater	VulnerabilityScore	ZoneType	IntakeClassification	VSA_ID	VA_ID
Groundwater	4	WHPA-C1		9	5
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Surface Water	0.9	IP2-1	n	1	4

Tables of Circumstances for Significant Drinking Water Threats



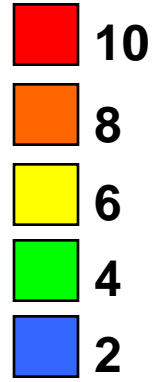
Zone D – 25 yr TOT

10 yr TOT

Zone A – 100 m

Zone B – 2 yr TOT

Zone C – 5 yr TOT



Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 3

3B. Issues Approach

1. Issues: What is a Drinking Water Issue?

Identified at an intake, well or monitoring well & located within one of the four vulnerable areas.

- Must result in the deterioration of the quality of water for use as drinking water.
- You have discretion here – deterioration of water is not defined. Therefore you can consider a number of different things in determining if there is deterioration.
 - Does the treatment system adequately deal with this parameter under extreme events?
 - Is the treatment system not sustainable related to that parameter? This is an issue. Set a benchmark lower than what is in the water quality now
 - Is the source of the contaminant of concern natural or anthropogenic?

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Step 3

3B. Issues Approach

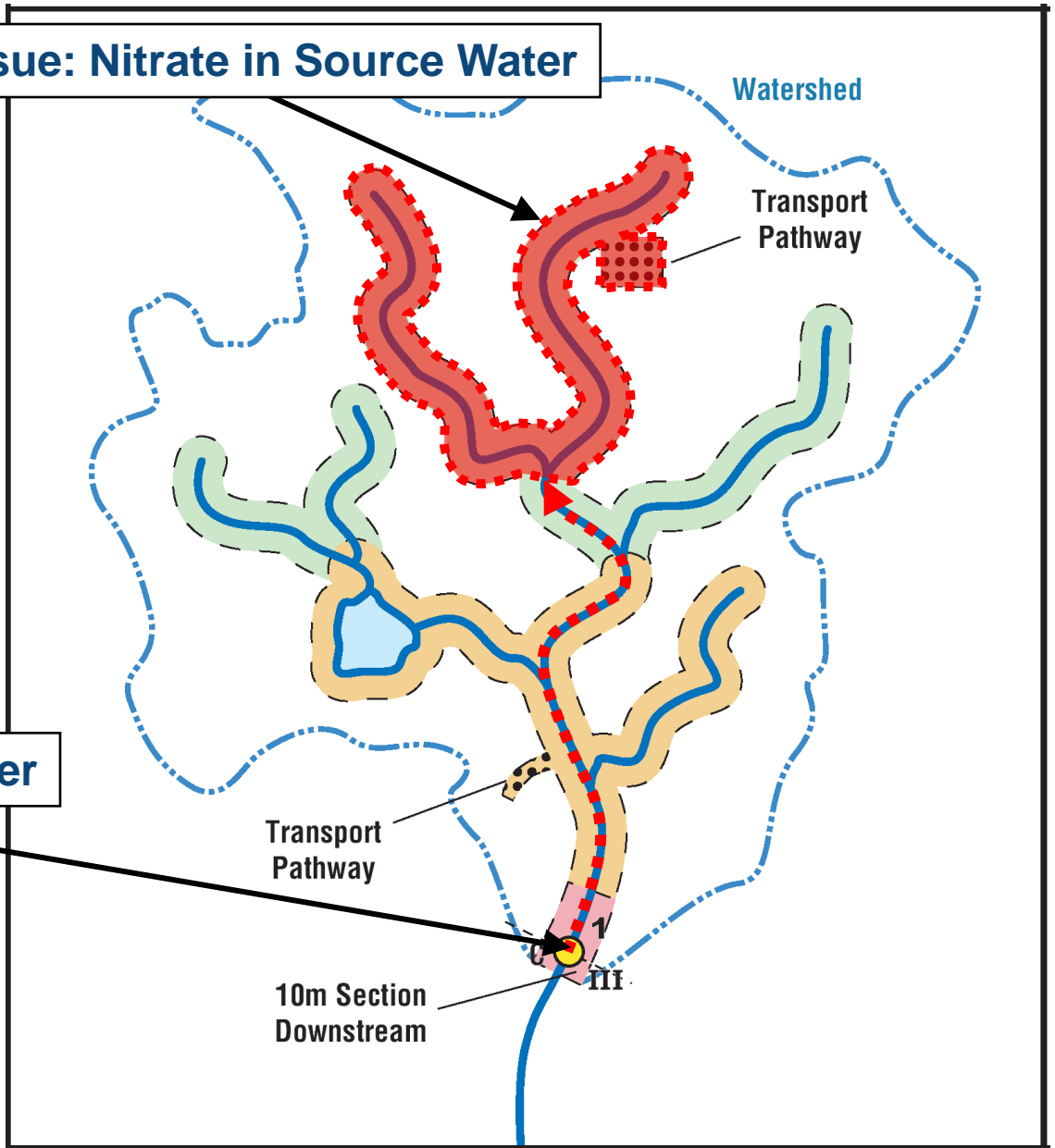
2. Defining and Listing Issues

- List parameter or pathogen of concern.
- List the well, intake, or monitoring well at which the issue occurred.
- Show the area within which threats could contribute to the issue.
 - This "issue contributing area" must be fully enclosed within one of the 4 vulnerable areas (WHPA, IPZ, HVA, SGRA).
 - There is no vulnerability score associated within this "issue contributing area".
 - If you can't determine the "issue contributing area", the assessment report must include a plan for determining the extent of this area.
- List of activities, conditions, and natural conditions that are associated with the parameter or pathogen (to link the issue with what could have caused the problem or may add to the problem in the future)

Describing Drinking Water Quality Issues (Surface Water example)

Issue: Nitrate in Source Water

Issue: Nitrate in Source Water



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3B. Issues Approach

3. Issues: Listing Circumstances

- Circumstances for Significant, Moderate, and Low threats within an Issue Contributing Area are different than listed with the threats approach
- An activity is Significant regardless of scoring if it
 - exists within an Issue contributing area, and
 - may contribute to the concentration of the parameter/pathogen identified as an issue
- A new list of activities and circumstances must be created for each Issue Contributing Area dependant on the issues identified.

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Step 3

3B. Issues Approach

4. Issues: Areas where activities or conditions are significant

Maps will be produced for each Issue Contributing Area

Defining the area

- Activities and conditions may contribute to the concentration of identified issues
- Of significant Drinking Water Threats

Each of the maps will have corresponding Issue documentation and lists of Significant drinking water threats, as produced in the previous steps

- In addition, if the Source Protection Committee thinks the threats contributing to the issue are outside their Source Protection Area (SPA), they must identify what SPA that they think the threats are located in.

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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Step 3

3C. Event Based Approach

1. Event Based Approach: Context and Application

- Used in SPAs with Type A and B intakes, and Types C and D intakes in Lake Nippising, Lake Simcoe, Lake St. Clair, or the Ottawa River.
- Based on local knowledge – activities are chosen to be evaluated through modeling
- If the release of a contaminant could cause an issue at the intake, these activities are considered significant, and the IPZ-3 delineation is adjusted to include this area.
- Note, the IPZ-3 delineation is only required where this modeling has been completed.

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ACT FOR CLEAN WATER

Step 3

3C. Event Based Approach

2. Event Based Approach: Listing Threats

- If you have completed modeling or an analysis of threats, and have shown they can create an issue at the intake, then, this activity is a **significant drinking water threat**.
- You can only identify existing activities through this process. Conditions can not be listed through this process.
- If the modeling or analysis does not show an activity can create an issue at the intake, then this activity can not be listed as a **significant drinking water threat**.

3. Event Based Approach: Listing Circumstances

- As with issues, the circumstances under which an activity is a significant drinking water threat change with the application of this methodology. Therefore, you must create a new list of circumstances.
- Therefore you must include the circumstances under which these activities are significant drinking water threats.
- This would require you to document:
 - the modeling approach or results to ensure it is clear that the circumstances that make this significant and that it is within the IPZ-3 and
 - modeling has shown that release of the contaminant could cause an issue at the intake.

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ACT FOR CLEAN WATER

Step 3

3C. Event Based Approach

4. Event Based Approach: Areas where Activities are Significant Drinking Water Threats

- The identification of areas where activities are significant for this approach is different than the other methods.
- The actual “areas where the activity is significant” is the location of the activity itself.
- Our expectation is that you would identify the parcel of land on which the activity is being undertaken. Therefore, to meet the requirements of the Act, you are required to create a map showing the parcel(s), and include documentation on what activity is significant within that parcel(s).

Step 1. Delineate Vulnerable Areas



Step 2. Score Vulnerable Areas



Steps 3A, 3B, 3C. Identification of Drinking Water Quality Threats

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Step 4. Enumeration of Significant Drinking Water Quality Threats



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4. Enumerating Significant Drinking Water Threats

- The assessment report is required to include the number of locations where a person is engaging in an activity or condition that is or would be a significant drinking water threat.
- Based on this, it is required to inventory the number of existing significant drinking water threats including:
 - “is” – interpret this as the locations where an activity is currently undertaken or a condition exists. (For example: fuel storage at a marina).
 - “would be” – interpret this as locations where the infrastructure is there to undertake an activity. (For example: during the winter these tanks may be empty, but you know they will have fuel seasonally and the infrastructure is there for the fuel. Or salt storage domes with no salt).

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Step 4

Enumerating
Significant
Drinking Water Threats

4. Enumerating Significant Drinking Water Threats

- The level of effort to do this is dependant on your knowledge of the source protection area and vulnerable areas, along with an understanding of the level of comfort of the source protection committee, stakeholders, and public.
- Where an activity is an obvious threat (gas station, where the quantity of fuel and chemicals are relatively standard), no site visit should be required.
- Where there is little information, high uncertainty, or a high level of discomfort around an activity or condition, a site visit may be considered appropriate.
- In some areas, SPCs and CAs will have to make decisions on how many site visits can be completed based on the time and resources available.

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Thank You!

Questions

A decorative graphic consisting of two overlapping, wavy, light blue shapes that resemble water or a stylized wave, positioned below the 'Questions' text.