
# Considering Sources of Drinking Water in your Environmental Assessment Project

OAIA Conference – October 17, 2018

Jennifer Moulton, Source Protection Programs Branch

# Presentation Outline

- What is source protection?
- How should source protection be considered when undertaking an environmental assessment project?
- What about protecting drinking water sources that are not included in source protection plans?
- Projects that create or amend source protection vulnerable areas – Regulation 205/18
- What should be included in the report?
- Questions / Discussion



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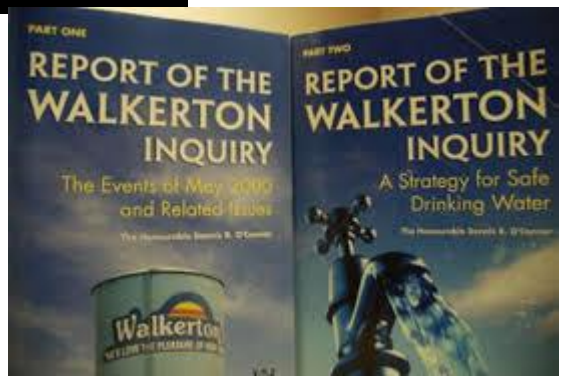
# How the Clean Water Act came to be


Walkerton Water Tragedy, May 2000




Inquiry led to 101 Recommendations

*Clean Water Act*, 2006 and Regulations



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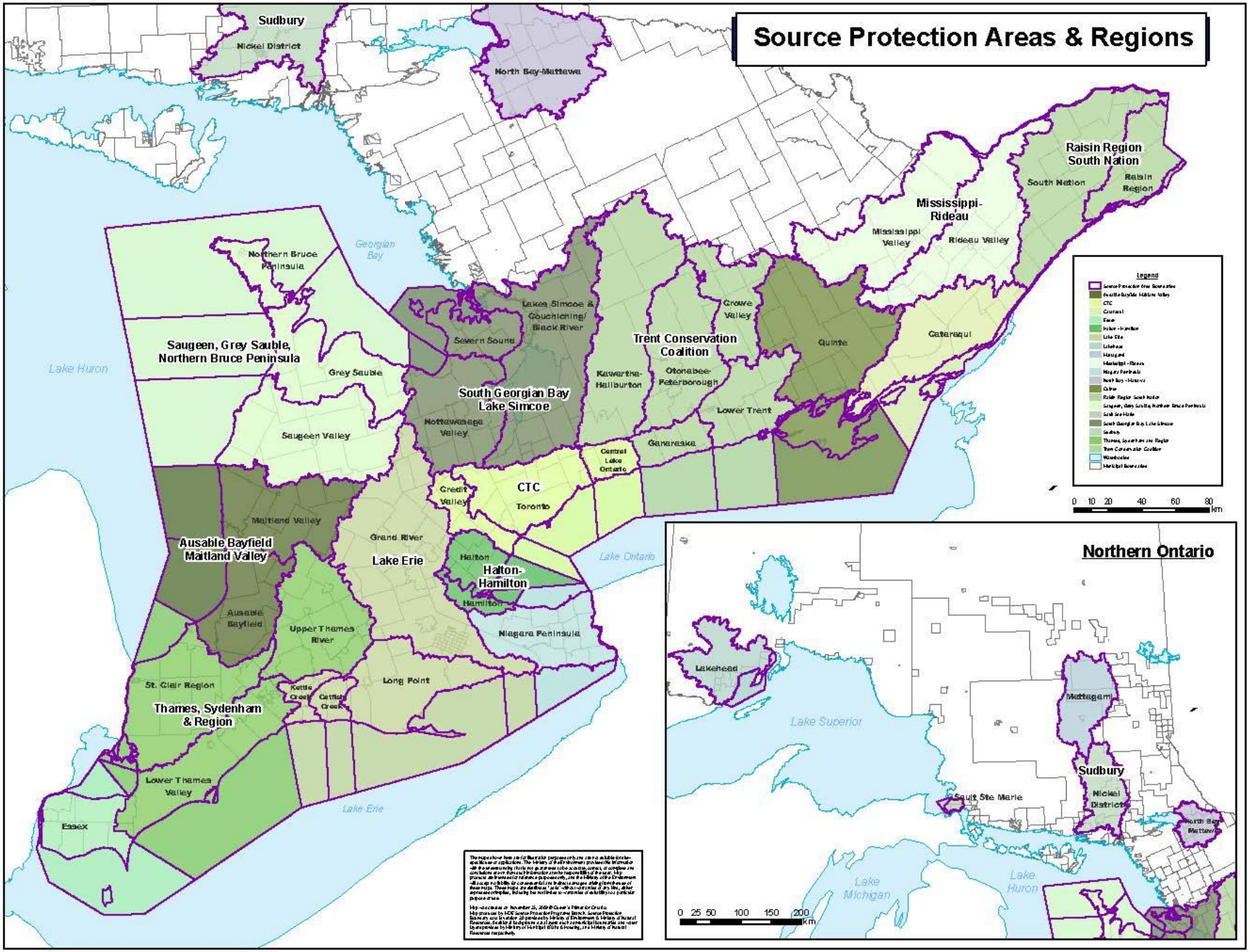

Source Protection Areas & Regions
Sudbury
Nickel District
North Bay-Mattawa
Raisin Region South Nation
South Nation
Raisin Region
Mississippi-Rideau
Mississippi Valley
Rideau Valley
Georgian Bay
Northern Bruce Peninsula
Saugeen, Grey Sauble, Northern Bruce Peninsula
Lake Huron
Grey Sauble
Saugeen Valley
Lakes Simcoe & Couchiching/ Black River
Severn Sound
South Georgian Bay Lake Simcoe
Nottawasaga Valley
Kawartha-Haliburton
Trent Conservation Coalition
Otonabee-Peterborough
Crowe Valley
Quinte
Lower Trent
Cataraqui
Central Lake Ontario
Ganaraska
CTC
Credit Valley
Toronto
Maitland Valley
Ausable Bayfield Maitland Valley
Grand River
Lake Erie
Halton
Halton-Hamilton
Hamilton
Lake Ontario
Ausable Bayfield
Upper Thames River
Niagara Peninsula
St. Clair Region
Kettle Creek
Catfish Creek
Long Point
Thames, Sydenham & Region
Lower Thames Valley
Essex
Lake Erie
Legend
0 10 20 40 60 80 km
Northern Ontario
Lakehead
Lake Superior
Mattagami
Sudbury
Nickel District
Sault Ste Marie
North Bay Mattawa
Lake Michigan
Lake Huron
0 25 50 100 150 200 km

# Prescribed Drinking Water Threat Activities

1 – **waste** disposal

2 – **sewage**

**Agriculture**

3 – application of Agricultural Source Materials
4 – storage of Agricultural Source Materials
5 – management of Agricultural Source Materials (aquaculture)

6 – application of Non Agricultural Source Materials
7 – handling and storage of Non Agricultural Source Materials

8 – application of commercial fertilizer
9 – handling and storage of commercial fertilizer

10 – application of pesticide
11 – handling and storage of pesticide

21 – livestock grazing and pasturing

12 – application of **road salt**
13 – handling and storage of **road salt**

14 – storage of **snow**

**Industrial**

15 – handling and storage of **fuel**

16 – handling and storage of dense non-aqueous phase liquid **( DNAPL)**

17 – handling and storage of an **organic solvent**

22 - (new) establishment and operation of a **liquid hydrocarbon pipeline**

18 – chemicals used in the de-icing of aircraft

**Water Quantity**

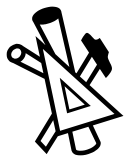
19 – consumptive water taking

20 – activity that reduces the recharge of an aquifer

*Clean Water Act (General Reg. 287/07)*

# Source Protection Plans

- Plans identified the municipal residential drinking water systems and associated vulnerable areas.
- Policies were developed to address the prescribed threats within the vulnerable areas.
  - Tools: land use planning, prescribed instrument, Part IV, education and outreach, incentives or other specified actions.



- Source protection plans were all approved by January 2016 and are now being implemented.

- http://conservationontario.ca/conservation-authorities/source-water-protection/source-protection-plans-and-resources/



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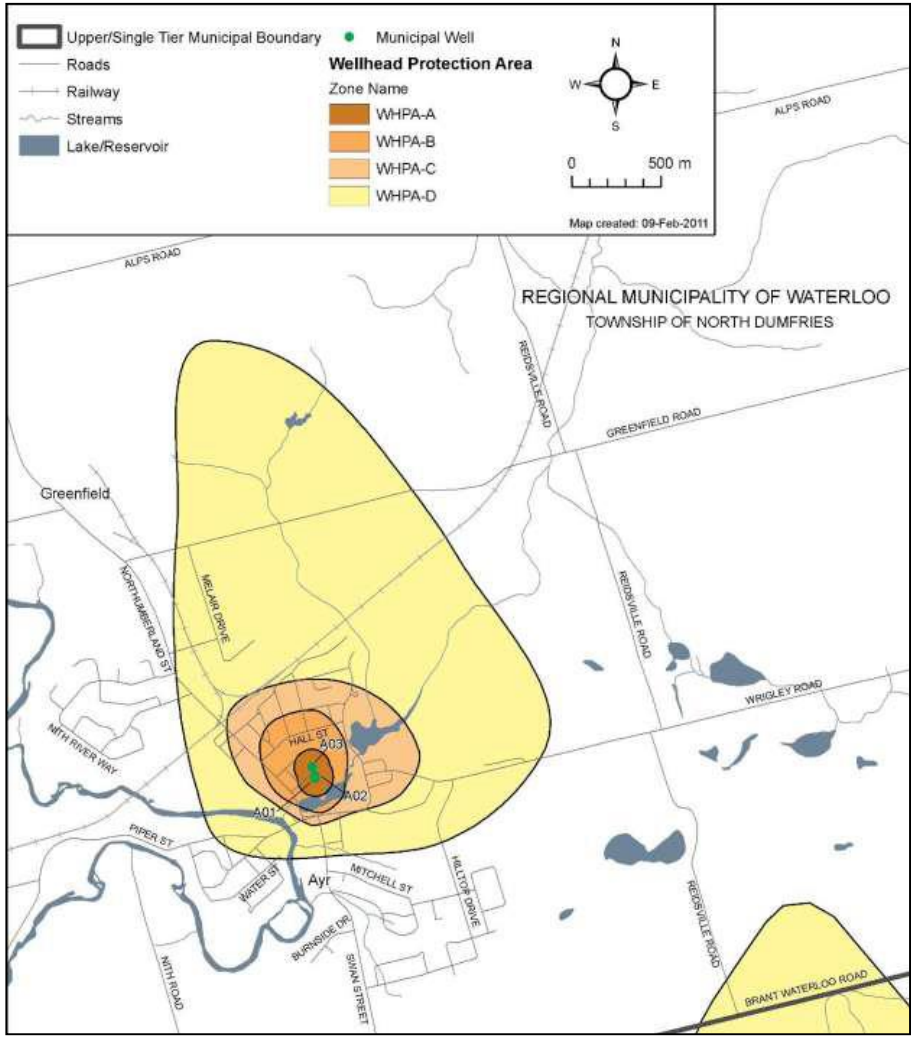
# Vulnerable Areas – Groundwater (WHPA)




- The WHPA is the area around the well that contributes water to a well. Its size is dependent on several factors, including type of aquifer (bedrock, sand) and the direction and speed that groundwater travels.
- Four water quality zones are delineated based on how long it takes water to move underground to the well. (the time of travel)
  - WHPA-A: 100m radius (quickest)
  - WHPA-B: 2 yr. Time of Travel (TOT)
  - WHPA-C: 5 yr. TOT
  - WHPA-D: 25 yr. TOT (slowest)



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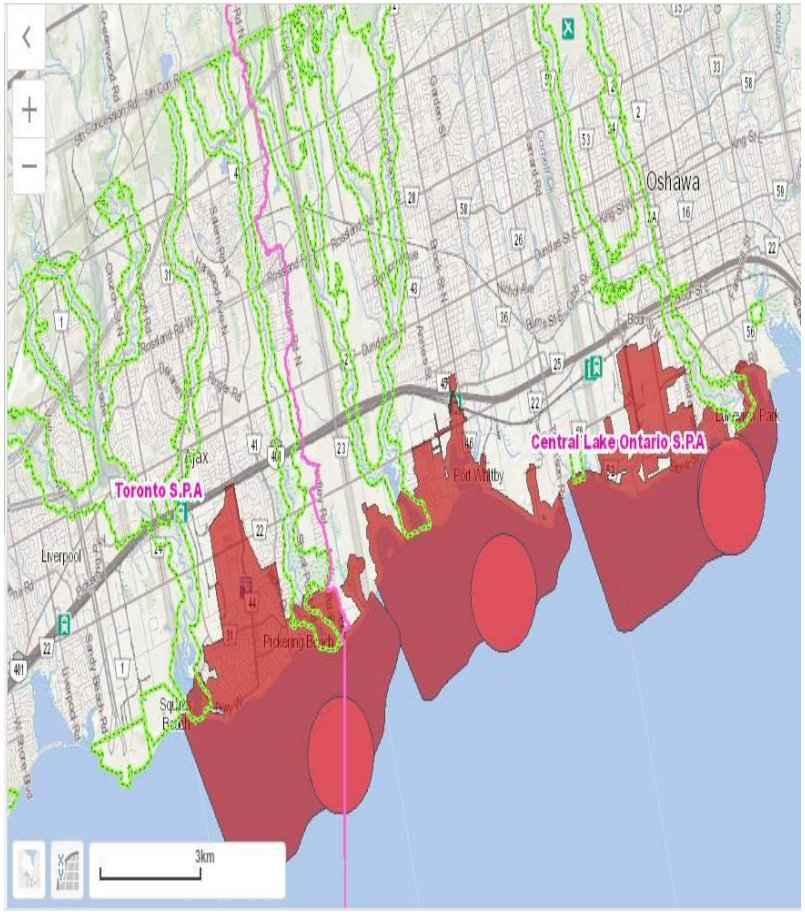
# Vulnerable Areas – Surface Water (IPZ)




- The vulnerable areas around a surface water intake are known as Intake Protection Zones (IPZs) and there are 3 subareas within the IPZ for water quality:
  - **IPZ-1**: zone closest to intake, most vulnerable, direct and immediate impacts to drinking water source possible; no spill response time
  - **IPZ-2**: zone further upstream from intake, direct impacts to drinking water source possible; limited spill response time
  - **IPZ-3**: zone covers larger portion of watershed; time available to manage spills
- Modelling and local site characteristics are used to delineate these protective zones



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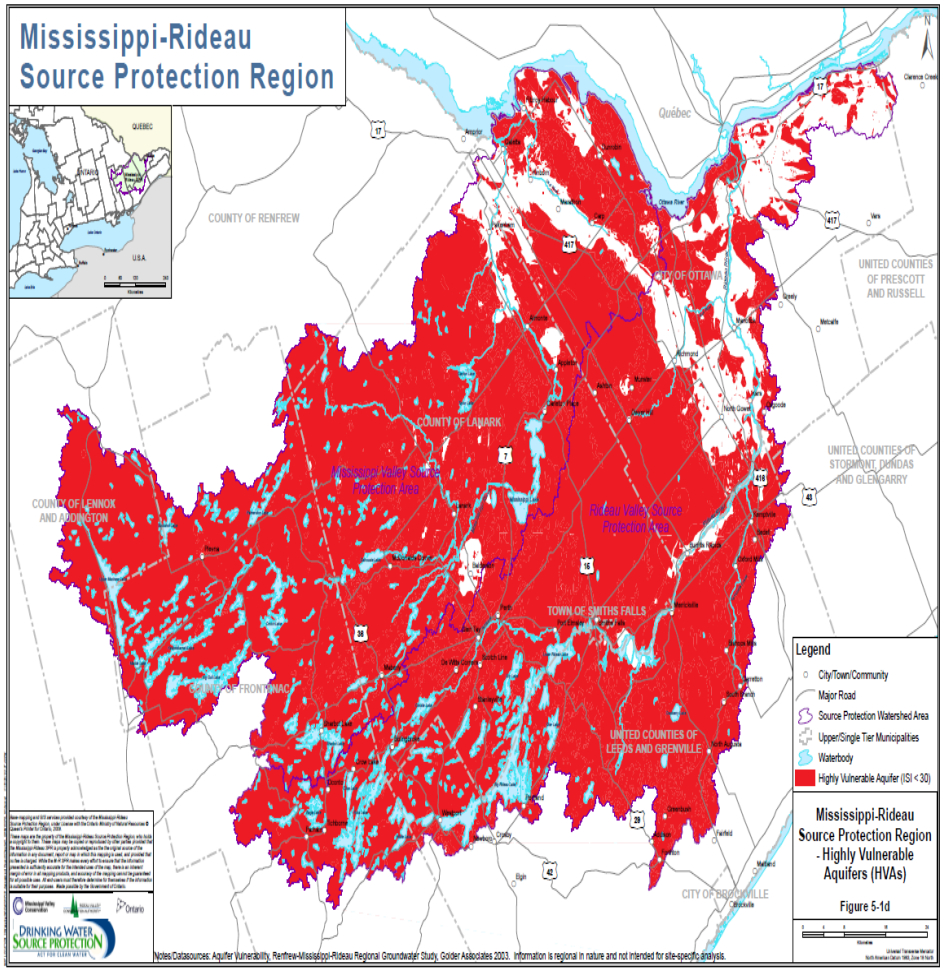
# Vulnerable Areas – Highly Vulnerable Aquifers (HVAs)




- Vulnerability of an aquifer is based on several factors, including its depth underground, the type of soil covering it, and the characteristics of the overlying materials.
- The faster water flows through the ground to an aquifer, the more vulnerable the area is to contamination.
- Technical analysis results in defining high, medium, or low groundwater vulnerability areas across the landscape
- High vulnerability areas are delineated and mapped as HVAs
- High, Medium and low groundwater vulnerability areas factor into the scoring of WHPA's
- *note – cannot have Significant Drinking Water Threats in an HVA



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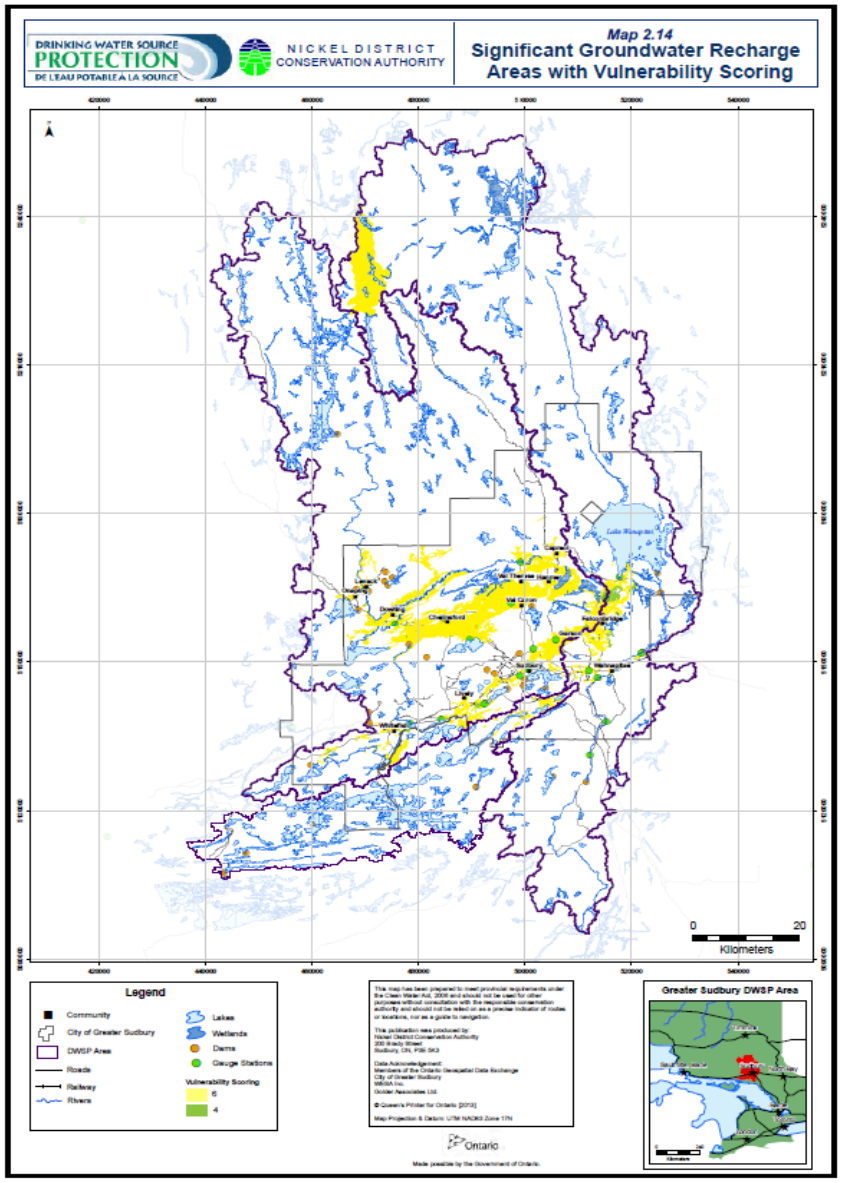
# Vulnerable Areas – Significant Groundwater Recharge Areas (SGRAs)




- A recharge area is the area of land where the rain or snow seeps into the ground and flows into an aquifer.
- A recharge area is considered 'significant' when it supplies more water to an aquifer used for drinking water than the land around it.
- These SGRAs often have more permeable soil, such as sand or gravel, and allow the water to seep more easily into the ground.
- SGRA is delineated as part of the water budget analysis
- *note – cannot have a Significant Drinking Water Threats in an SGRA

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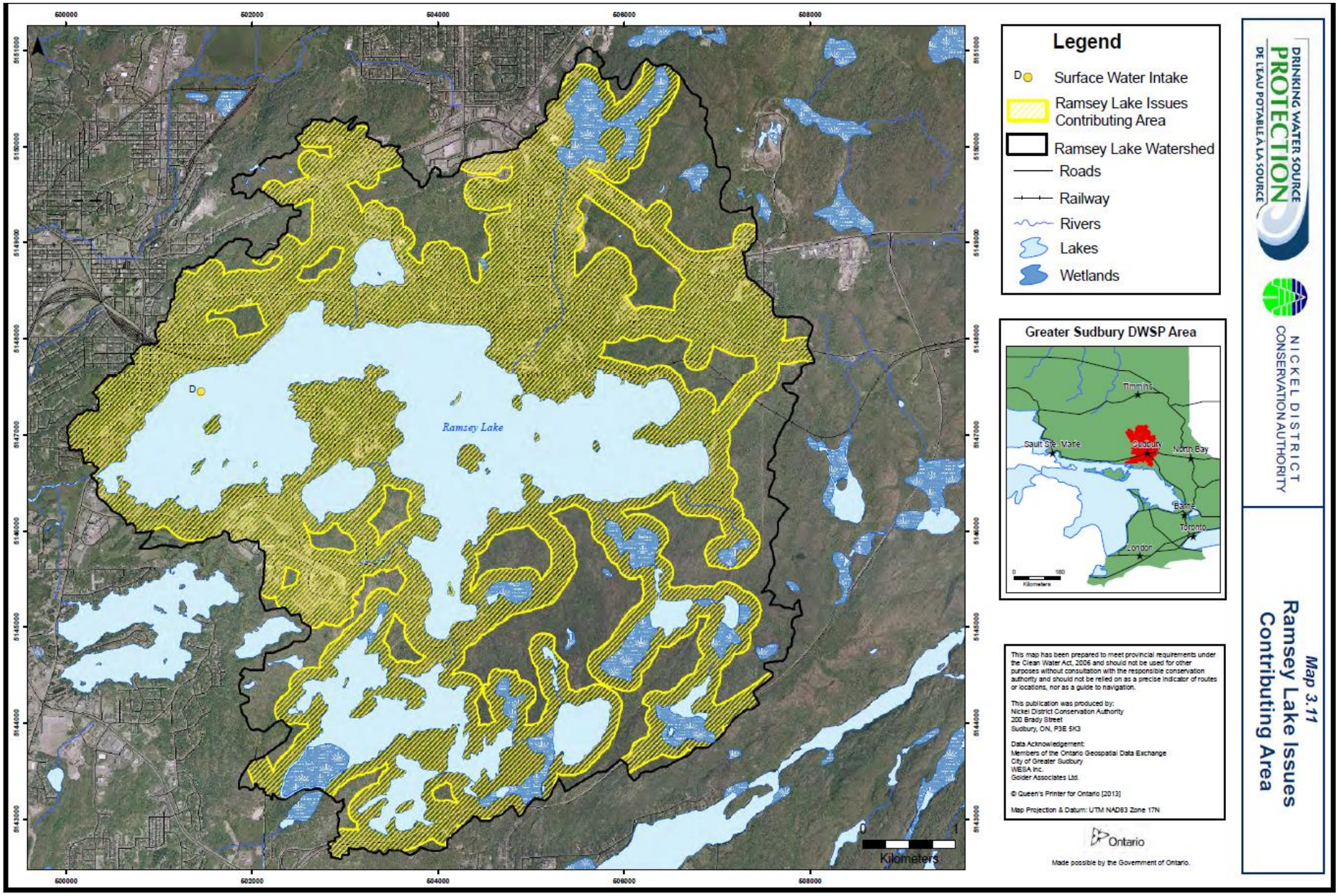
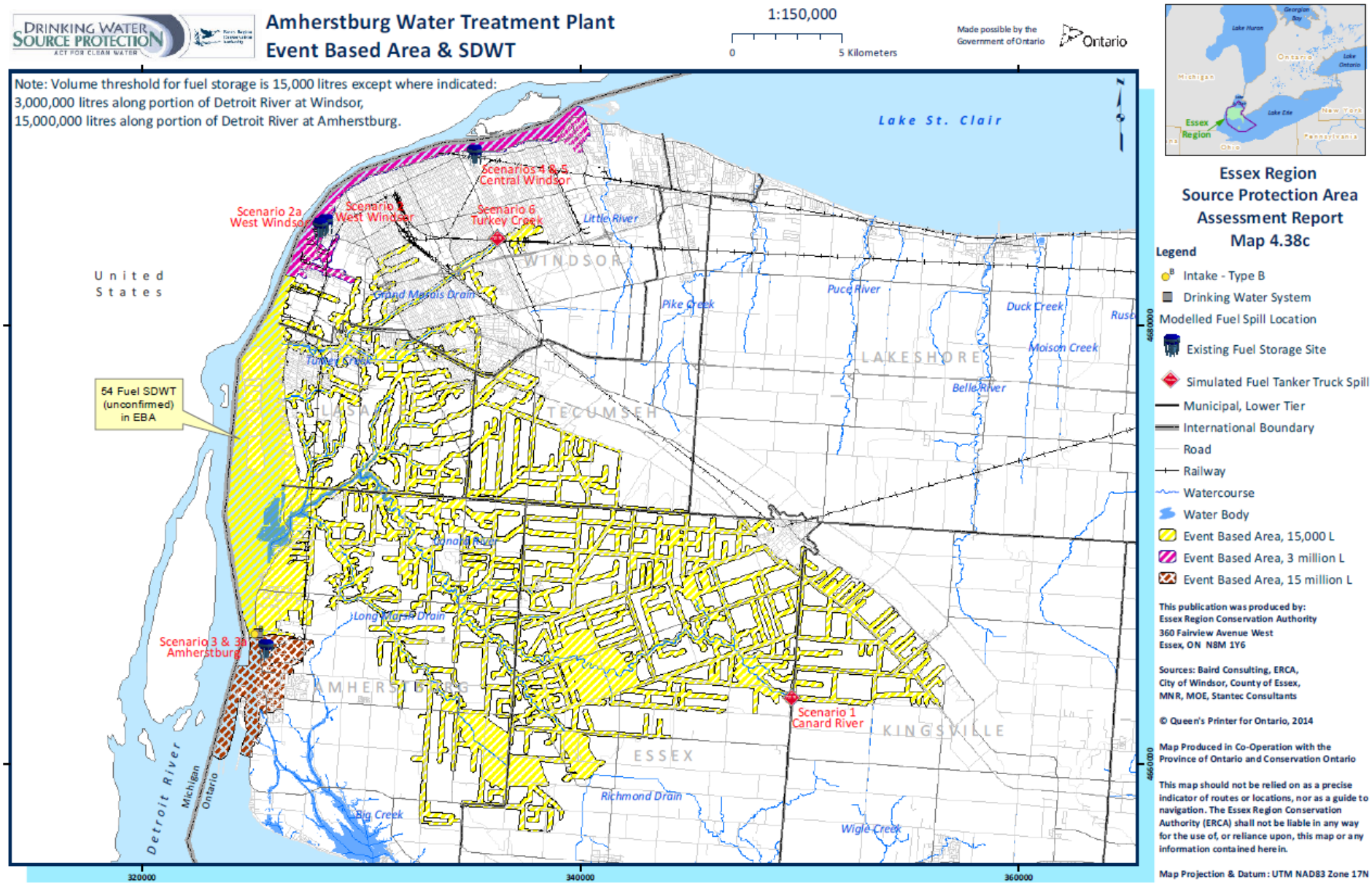
# Issue Contributing Area (ICA)



# Event Based Areas (EBAs)



# Vulnerable Areas – Quantity (WHPA Q1, Q2 , IPZ-Q)

- Water budgets are used to define areas where water quantity is at risk.
- Where a tier 3 water budget shows a system is vulnerable to depletion the following areas are defined:
  - WHPA Q1- areas  around a well where consumptive water takings can pose a risk.
  - WHPA Q2- areas around a well where reductions in recharges can pose a risk
  - IPZ-Q- areas around an intake where consumptive water takings or recharge can pose a risk.



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# Considering Source Protection in Environmental Assessment Projects

- Many types of projects that are subject to the *Environmental Assessment Act* have the potential to affect sources of drinking water.
- Projects occurring in *any* of the vulnerable areas could be subject to policies that prohibit or manage the activity proposed or that is otherwise part of the undertaking.
- Examples:
  - Waste management facilities
  - Fuel storage (even during construction)
  - Road salt application
  - Sewage works infrastructure (incl. stormwater)




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# Determining Impact

If your project is occurring in a source protection area:

1. Map the location of the project on the Source Protection Information Atlas (SPIA)
    - Don’t forget to turn on all relevant layers.
    - This will tell you what source protection area your project is in and whether the project is proposed to occur in any vulnerable areas.



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# Example SPIA Output Map

Upper Tier Municipality: **REGIONAL MUNICIPALITY OF YORK**

Lower/Single Tier Municipality: **TOWN OF EAST GWILLIMBURY**

Township Concession and Lot: **EAST GWILLIMBURY CON 1 EAST OF YONGE STREET, LOT 106**

Assessment Parcel Address: **MOUNT ALBERT RD**

Assessment Roll #: **19540000239420000000**

**Source Protection Details for Location**

Source Protection Area. **Lakes Simcoe and Couchiching/Black River**

Wellhead Protection Area: **B** ; score is **6**

Wellhead Protection Area E (GUDI): **No**

Intake Protection Zone: **3** ; score is **6.3**

Issue Contributing Area: **No**

Significant Groundwater Recharge Area: **No**

Highly Vulnerable Aquifer: **Yes** ; score is **6**

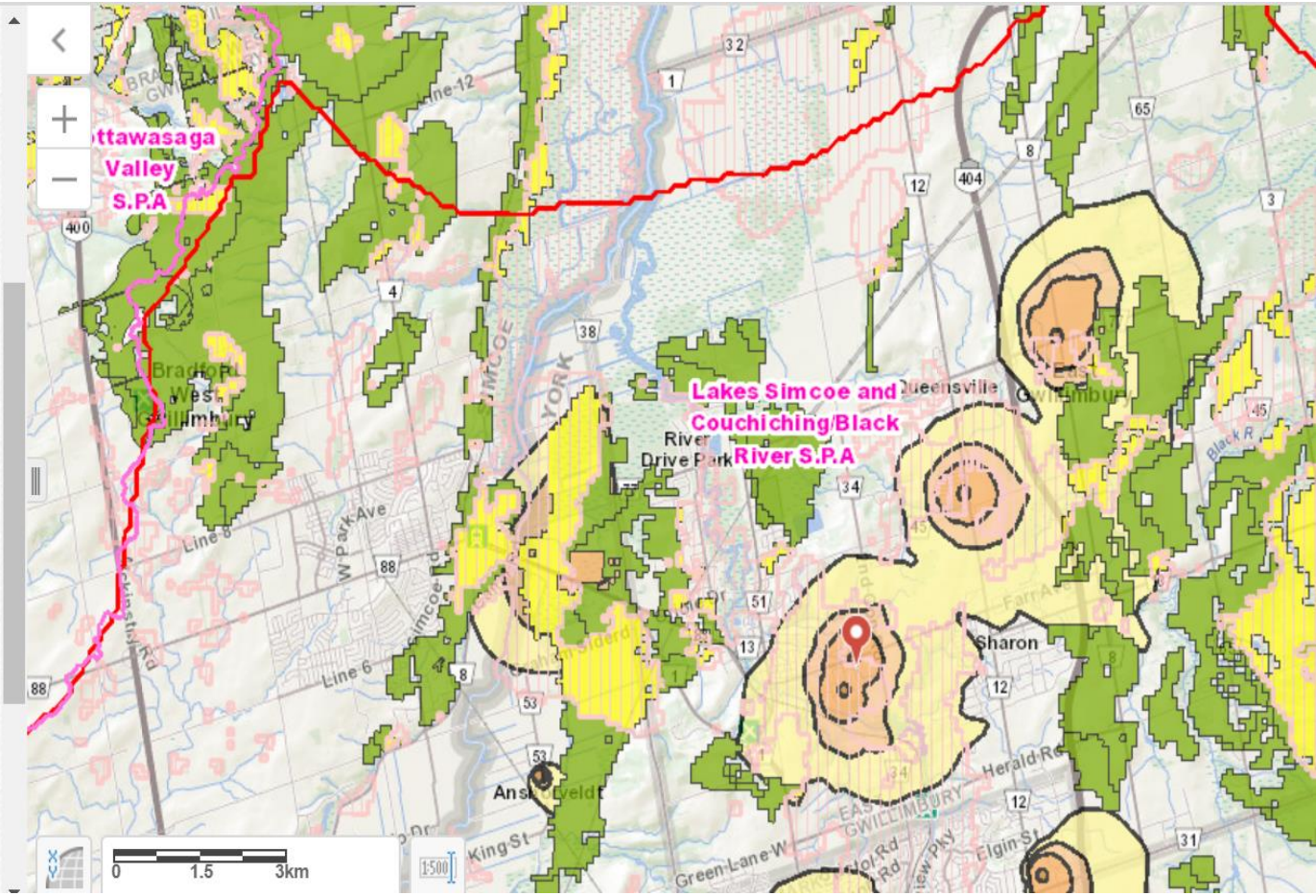
Event Based Area: **No**

Wellhead Protection Area Q1: **Yes** ; Stress: **Moderate**

Wellhead Protection Area Q2: **Yes** ; S[illegible]**rate**

Intake Protection Zone Q: **No**

Use the Policy search tab to see if any policies apply – for more details see the source protection plan



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# Determining Impact Continued

2. Find the relevant source protection authority website for a copy of the plan.
    - Include the project manager from the source protection authority on all stakeholder notifications.
3. Understand what activities associated with your project may be a drinking water threat.
4. Assess how the policies in vulnerable areas may apply to your project, influence alternative options or designs, and whether the project can go forward, and if you require any mitigation measures.
5. Document the findings in your Environmental Assessment report.



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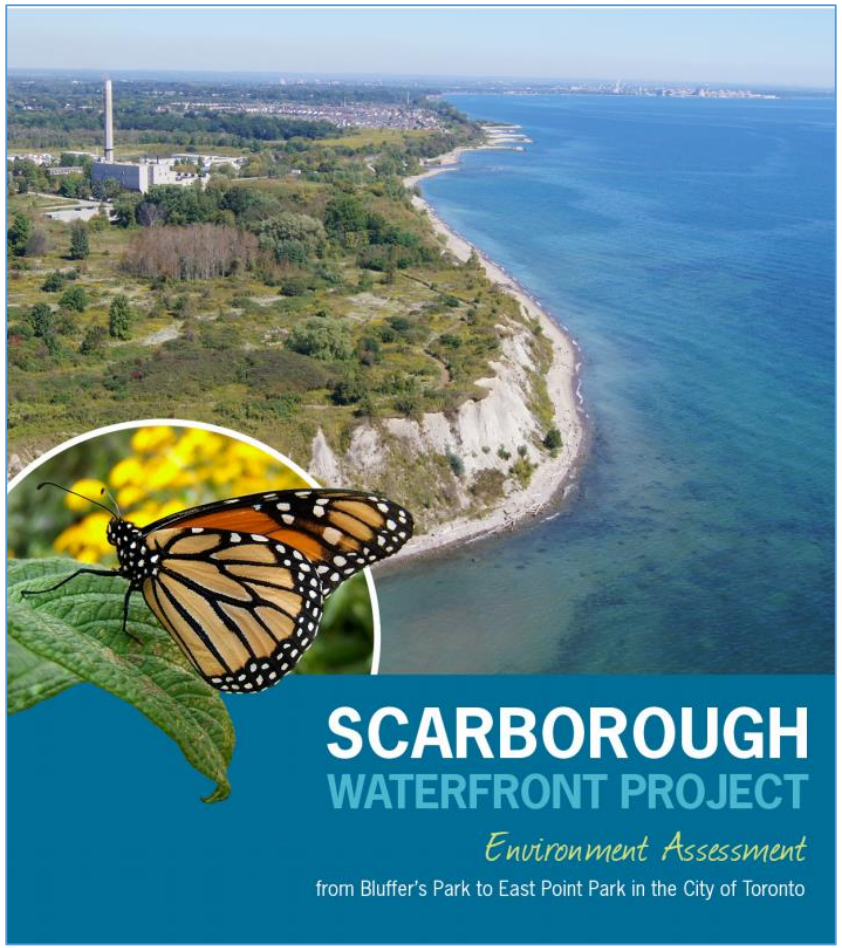
# Examples




Metrolinx

**Union Station Rail Corridor (USRC) East Enhancements Transit Project Assessment Process (TPAP) Environmental Project Report – Revised Draft**

**Prepared by:**

AECOM
30 Leek Crescent, Floor 4
Richmond Hill, ON, Canada L4B 4N4
www.aecom.com

tel: 905 882 4401
fax 905 882 4399

July, 2018
Project Number: 60517668



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# Other Sources of Drinking Water

- Projects occurring outside of source protection areas or vulnerable areas may impact sources of drinking water not explicitly covered by the Clean Water Act.
- Identify other sources of drinking water; consider how projects may impact them.
- Consider:
  - What is the nature of the system/source
  - What is the nature of the activity proposed
  - What mitigation measures could you employ



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# Drinking Water Supply Projects

- Some environmental assessment projects have the potential to require the creation of new, or the amendment of existing, vulnerable areas.
- Generally, municipal drinking water system projects are undertaken following the Municipal Engineers Association Class EA (Schedule A, B and C).
- New vulnerable areas or amendments to existing areas need to be reflected in the relevant source protection plan.



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# Regulation 205/18

- "*Municipal Residential Drinking Water Systems in Source Protection Areas*"
- Safe Drinking Water Act
- Effective July 1, 2018
- Intended to ensure sources of drinking water for new or expanding drinking water systems are protected before providing water to the public.



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# Environmental Impact

- Where a project results in new or amended vulnerable areas around a well or intake, source protection policies will apply in those areas.
- This can create an 'environmental impact' (economic, social) because certain activities that exist today or in the future will be subject to the policies once the vulnerable area is included in the plan.
- **This 'environmental' impact should be assessed and consulted on early (when assessing alternatives),** particularly where landowners could be impacted by policies in a source protection plan**.**



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# What should you do?

- Municipal proponent should contact the source protection authority to discuss nature of the project and need to delineate vulnerable areas and assess possible impacts as early as possible.
- For each alternative location, a desktop mapping exercise - to evaluate landuse activities near the possible sites of the new well or intake - should be undertaken to understand where significant threats could occur and policies will apply.
  - Director's Technical Rules under the Clean Water Act enable certain methods to delineate WHPAs and IPZs.
- This should factor into preferred alternative selection.



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# Report Contents

Your project report should:

1. Identify whether any project activities (during construction or operation) would be a drinking water threat.
2. Identify the relevant source protection area(s) if applicable.
3. Identify vulnerable areas and/or any other sources of drinking water that could be affected by any of the alternatives for the project.
    - **This information should be documented in the evaluation of the preferred alternative.**



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# Report Contents Continued

4. Upon selection of the preferred alternative the report should identify:
   - Any vulnerable areas or other drinking water sources that are in the project area
   - Source protection policies that apply
   - How the policies may affect the undertaking
   - Mitigation measures to reduce risks to sources of drinking water
5. Consultation summary should include any responses from the source protection authority.



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# DISCUSSION & QUESTIONS

- Challenges with incorporating source protection in EAs?
  - Which EA projects are more challenging than others?
- Prescribed threats under Clean Water Act –any surprises? –perceived gaps?
- Suggestions for improvements to approvals process for drinking water systems?
  - What future challenges do you see coming that the process should prepare for?



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# Contact Information

Jennifer Moulton

Senior Drinking Water Program Advisor,
Source Protection Programs Branch,
Ministry of the Environment,
Conservation and Parks

Jennifer.l.moulton@Ontario.ca

519-860-7851

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