Niagara Region

Public Works
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MEMORANDUM

PWC-C 10-2019

Subject: Source Water Protection Overview

Date: May 7, 2019

To: Public Works Committee

From: Jen Croswell, C.Tech.

After the Walkerton tragedy in May 2000, Justice Dennis O'Conner was commissioned to lead an inquiry into the contamination of the Walkerton municipal water supply and more broadly, the safety of Ontario's drinking water. The results of the Walkerton inquiry included 121 recommendations to ensure the protection of municipal drinking water in Ontario—all of which have been implemented. Source water protection planning, under the *Clean Water Act, 2006* (CWA), fulfills several of these recommendations. The purpose of this memorandum is to inform Regional Council about the source water protection program in Niagara.

Multi-Barrier Approach

Source water protection is part of the multi-barrier approach towards the protection of drinking water. Ontario's drinking water is protected and governed, with a source-to-tap focus, under two main acts: The *CWA*, and the *Safe Drinking Water Act, 2002 (SDWA)*.

The CWA focuses on prevention and protects sources of drinking water by:

- Requiring source water protection plans for municipal drinking water systems within Conservation Authority boundaries;
- Outlining a mandatory framework for how vulnerability and risks to drinking water are assessed and determined; and,
- Providing municipalities with the authority to regulate threat activities, as determined under the established regulations.

The SDWA ensures the provision of safe drinking water by requiring:

- Adequate treatment processes dependent on source water characteristics;
- Mandatory licencing, operator certification and training requirements;
- Regular and reliable testing and monitoring of both the treatment process and distribution system to ensure health-based drinking water standards are met;
- Prescribed corrective actions in the event of adverse test results; and
- Routine inspections by the Ministry of Environment, Conservation, and Parks (MECP).

Niagara Source Protection Planning

The Niagara Peninsula Source Protection Area (Area) overlies the same jurisdiction as the Niagara Peninsula Conservation Authority (NPCA) and encompasses Niagara region and portions of Haldimand County and the City of Hamilton. Niagara Region is the only municipality which owns and operates municipal drinking water systems (six total) within these boundaries and the identified vulnerable areas and risk mitigation policies currently only apply to Niagara Region's drinking water systems.

A science based assessment for the Area was conducted and summarized within an assessment report. The assessment included:

- Delineations of vulnerable areas including municipal water treatment plant Intake Protection Zones (IPZs), highly vulnerable aquifers, and significant groundwater recharge areas;
- Assessments of activities that would be significant or moderate drinking water threats in these vulnerable areas, particularly with respect to municipal drinking water systems;
- Identification of water quality issues associated with the raw (untreated) water supplied to the municipal water treatment plants, which could be addressed through source protection planning;
- A water budget analysis and water quantity stress assessment for the whole source protection area; and
- General background information that may be useful in developing the Source Protection Plan (SPP).

The findings identified in the assessment report are used to focus risk mitigation policies within the SPP. These policies are based on the vulnerability and the associated hazards which are presented by threats (as defined in O. Reg. 287/07). The vulnerability scores for Niagara Region's IPZs are identified in Table 1. Associated mapping can be found in Appendix I.

Table 1: Niagara's Vulnerability Scores

Intake	IPZ-1 (distance to intake)	IPZ-2 (two hour time of travel)
Niagara Falls	**8.0**	6.4
Port Colborne	**9.0**	**8.1**
Welland	7.0	N/A (contained within IPZ-1)
Decew Falls Main Intake and 406	**8.0**	4.9
Decew Falls Lake Gibson	**8.0**	5.6
Rosehill	7.0	5.6
Grimsby	5.0	4.0

The IPZ-1 for the Decew Falls and Niagara Falls intakes and the IPZ-1 and IPZ-2 for Port Colborne's intake are considered highly vulnerable and significant drinking water threats have been identified for these intakes in accordance with the CWA. An IPZ-3, which is based on local modelling, was determined specifically to identify diesel fuel spills as a significant threat in the Welland Canal which impacts the Decew Falls, Port Colborne, and Welland drinking water systems. These and the remaining intakes also have moderate and low risk threats associated with them. Intake vulnerabilities and threats are managed through the multi-barrier approach, identified above, which includes adequate water treatment, testing, and verification in addition to a preventive approach of risk mitigation through the SPP. A table of identified significant drinking water threats can be found in Appendix II.

Policy options to manage the identified threats range from softer approaches (such as encouraging best management practices by way of a public education program) to more regulatory style approaches (such as requiring risk management plans), and in specific cases, particular activities may be prohibited within the IPZ. Some significant drinking water threat policies, such as the requirement of a risk management plan or prohibition, are enforceable under Part IV of the CWA and carry penalties if not complied with.

The rationale for policy choices are summarized in the explanatory document. The SPP was approved by the MECP in December 2013 and came into effect on October 1, 2014. As of March, 2018, the implementation of the SPP was deemed as "progressing well/on target" since the "majority of threats have been assessed and the remaining policies are on track for implementation".

Roles and Responsibilities

The CWA defines several contributor groups which are unique to source water protection. These include:

- Source Protection Authority – Follows the same structure as the current NPCA board;
- Source Protection Committee – Includes municipal, sector, and public interest representatives; and
- Risk Management Official and Risk Management Inspector – Appointed by Regional Council, or delegated authority, and is typically employed by the municipality.

In April 2016, Jen Croswell, Water Compliance Specialist, was appointed as Risk Management Official and Risk Management Inspector by the Commissioner of Public Works. Deanna Barrow, Manager of Quality and Compliance, was appointed as back-up. This appointment was communicated to Public Works Committee through PWC-C 16-2016.

In addition to the contributors identified above, many other stakeholders contribute to the planning and implementation of source protection in Niagara. A high-level overview of responsibilities under the CWA has been outlined in *Table 2*:

Table 2: Clean Water Act, 2006, Roles and Responsibilities Overview

Entity	**Role**	**Responsibility**
Ministry of Environment, Conservation, and Parks	Governing Body	Provide guidance, oversight, approval and funding to Source Protection Authority
Niagara Peninsula Conservation Authority	Source Protection Authority	Completes Section 36 amendments for the SPP
Niagara Peninsula Conservation Authority	Source Protection Authority	Facilitates annual implementation reporting, Source Protection Committee meetings, and plan updates
Independent/Sector Representatives	Source Protection Committee	Reviews and approves annual reporting and plan updates
Council (Regional and Area Municipal)	Governing Body	Approves revisions to the SPP via Council resolution
Niagara Region	Technical Expert	Completes Technical work for CWA Section 34/36 amendments to the plan
Niagara Region	Risk Management Official and Risk Management Inspector	Enforces Part IV of SPP policies
Niagara Region	Risk Management Official	Completes annual reporting on Part IV enforcement activities
Niagara Region	Policy Implementer	Various departments (Water and Wastewater, Transportation and Planning and Development) implement source protection policies
Niagara Region	Stakeholder	Participates in consultation opportunities
Area Municipality/Other Agencies/Public	Policy Implementer	Implements source protection policies
Area Municipality/Other Agencies/Public	Stakeholder	Participates in consultation opportunities

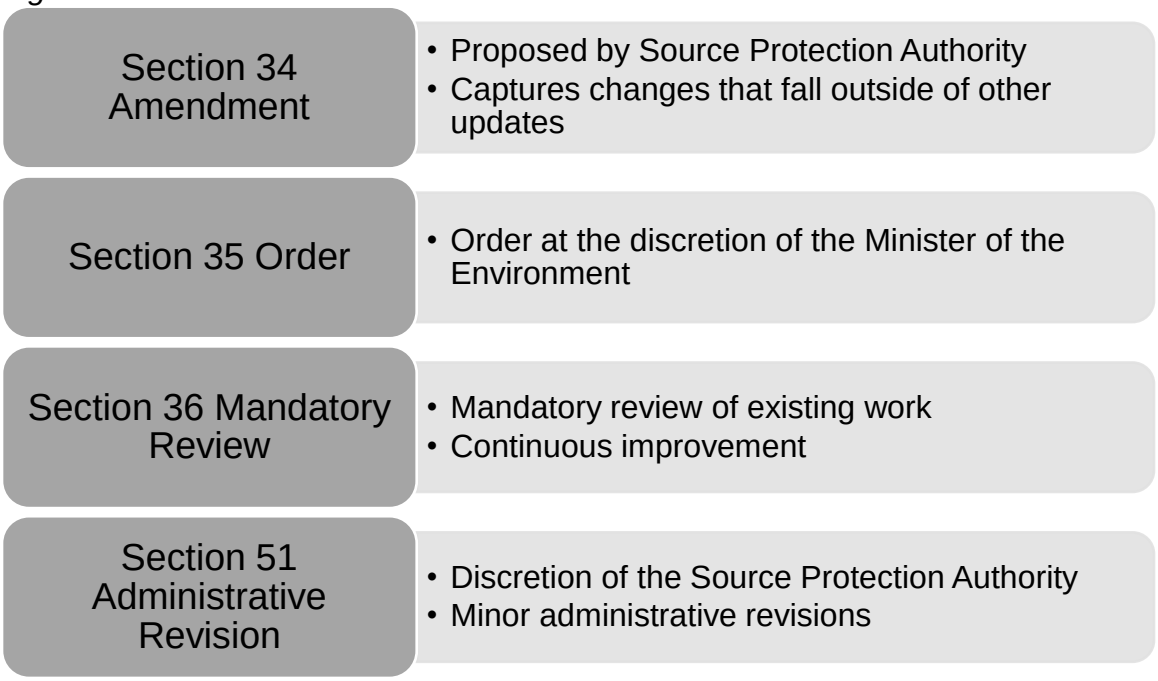
SPP Updates

Within the next five (5) years, Niagara Region is anticipating changes to the IPZs of the Decew Falls, Niagara Falls, Welland, and Rosehill drinking water systems. In most cases, it is anticipated that these changes will reduce the vulnerability and resulting threats to the impacted IPZs. See Table 1Table 3 for a high-level description of this work. Updates to the SPP are expected and can be initiated by several mechanisms within the CWA. These mechanisms are identified in Figure 1.

Table 3: Anticipated Infrastructure Changes Impacting Existing Intake Structures

Water Treatment Plant	Description	Motivation
Decew Falls	Encasement of existing raw water channel	Reduction in land-use impacts and increase in supply security
Niagara Falls	Relocation from Welland River to Niagara River	Ability to maintain water taking during Ontario Power Generation maintenance work on hydro canal
Welland	Minor relocation	Major water treatment plant upgrade requiring minor relocation of intake for water taking
Rosehill	Increase distance from shore and depth of intake	Life-cycle replacement and reduction in land-use impacts

Figure 1: SPP Amendment Mechanisms under CWA



The SPP is currently undergoing a Section 36 mandatory review which, where timing permits, will include the anticipated infrastructure work to Niagara Region's drinking water intakes and other area of interest as identified in the Section 36 work plan proposal.

It should be noted that the IPZ delineation is current to the date of plan approval by the MECP (December 2013). Mapping updates will be completed as the source water technical work is undertaken and integrated into the assessment report. Technical work will be carried out in stages as this work is completed on a per project basis. O. Reg. 205/18 under the SDWA ensures that the SPP has been updated prior to new intake infrastructure being put into service.

In the event the timing of these changes does not coincide with the mandated Section 36 update, a Section 34 amendment can be initiated. In both cases, Niagara Region will be an active participant in the planning process and Regional Council, along with impacted area municipal Councils, will be required to approve the SPP prior to final MECP approval.

Annual Reporting

As identified above, NPCA is responsible for annual source protection program reporting as mandated under the CWA. Niagara Region and other policy implementers work collaboratively with NPCA by providing information required to complete the annual progress report. The 2018 annual progress report will be published in the coming months.

Additional Information

Additional source water protection resources, including the SPP, assessment report, explanatory document, work plan proposal, and annual progress reports can be found on the Niagara Peninsula Source Water Protection website (http://www.sourceprotection-niagara.ca).

Respectfully submitted and signed by

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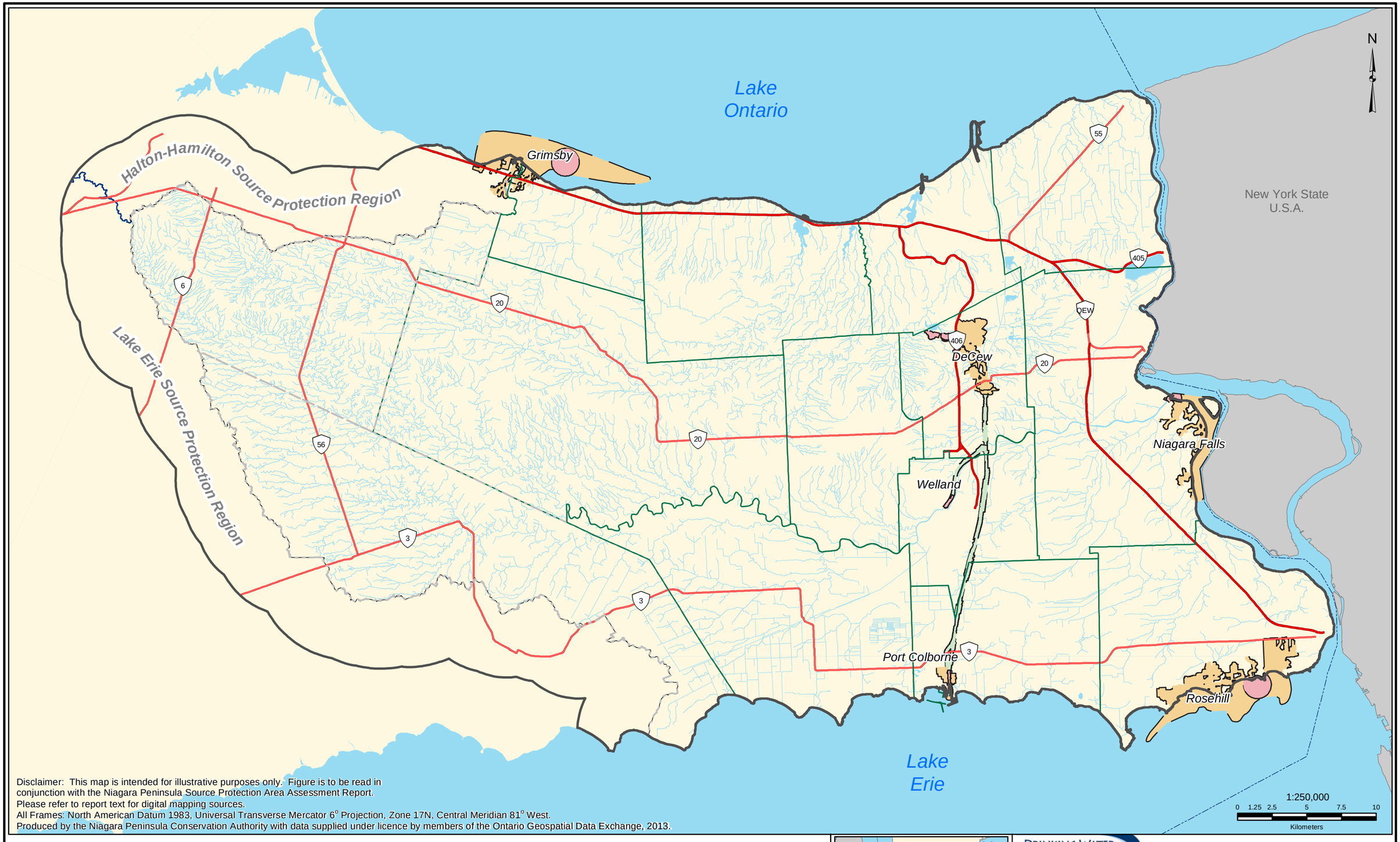
Jen Croswell, C.Tech., RMO/RMI
Water Compliance Specialist

Appendix I Map of Niagara Region's Intake Protection Zones
Appendix II Identified Significant Drinking Water Threats for Niagara Region's Intake Protection Zones

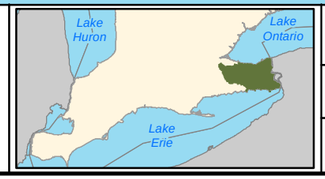


Disclaimer: This map is intended for illustrative purposes only. Figure is to be read in conjunction with the Niagara Peninsula Source Protection Area Assessment Report.
Please refer to report text for digital mapping sources.
All Frames: North American Datum 1983, Universal Transverse Mercator 6° Projection, Zone 17N, Central Meridian 81° West.
Produced by the Niagara Peninsula Conservation Authority with data supplied under licence by members of the Ontario Geospatial Data Exchange, 2013.

Legend

- International Boundary
- Major Highways
- Highways
- Roads
- Watercourse
- Ponds, Reservoirs, Lakes
- Extended Context Area
- Niagara Peninsula Source Water Protection Area
- Lower Tier Municipality
- Upper Tier Municipality

Intake Protection Zone
- IPZ-1
- IPZ-2
- IPZ-3



DRINKING WATER SOURCE PROTECTION — ACT FOR CLEAN WATER

NPSPA Assessment Report

Figure 5-6: Intake Protection Zones

NIAGARA PENINSULA CONSERVATION AUTHORITY

Wednesday, October 9, 2013

Ontario

PWC-C 10-2019 Appendix II – Identified Significant Drinking Water Threats for Niagara Region's Intake Protection Zones

Threat Category	Decew Falls IPZ-1	Niagara Falls IPZ-1	Port Colborne IPZ-1	Port Colborne IPZ-2
1 - Waste disposal sites	x	x	x	x
2 - Sanitary, storm, and industrial discharges	x	x	x	x
3, 4, and 21 – Agricultural source material (application and storage)	x	x	x	x
6, 7 – Non-agricultural source material (application and storage)	x	x	x	x
10 – Pesticide application				x
11 – Pesticide storage and handling				x
13, 14 – Road salt and snow storage				x
18 – Aircraft de-icing runoff				x

A full list of possible prescribed drinking water threats, as identified in Ontario Regulation 287/07, is included below:

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