Significant Drinking Water Threat Assessment Report for Proposed Alterations

City of Waterloo

2024

Revision History

Staff are responsible for ensuring that this report remains current to reflect relevant source protection plan policy amendments, regulatory changes, or modifications to the systems, as required.

Details of report issues and revisions are provided in the summary tables below.

Date	Version Number	Description	By
October 2, 2023	N/A	Draft	E. Thuss
November 17, 2023	1.0	Original Issue	E. Thuss
February 13, 2024	2.0	Updated to reflect City of Waterloo's 2023 SDWTs.	P. Mendez
January 2025	3.0	Updated to reflect City of Waterloo's 2024 SDWTs.	P. Mendez

1. Background/Context

The *Clean Water Act, 2006* (CWA) established a process to create locally-developed Source Protection Plans (SPP) for each watershed in Ontario to protect the quality and quantity of drinking water sources. Through this process, vulnerable areas are delineated and policies established to mitigate the impacts to drinking water threats from a number of prescribed activities. These activities include sanitary systems (sewers and pumping stations), stormwater management systems (ponds, drainage system outfalls, infiltration facilities), and combined sewers.

Sanitary and stormwater management systems within the Region of Waterloo are located in the Lake Erie Region Source Protection Region and are subject to the policies of the Region of Waterloo chapter of the Grand River Source Protection Plan. Note, there are no combined sewers within the Region of Waterloo.

The Ministry of Environment Conservation and Parks (MECP) has issued Consolidated Linear Infrastructure Environmental Compliance Approvals (CLI-ECA) to the Region of Waterloo and area municipalities for municipal sewage collection systems and stormwater management systems. Any proposed alteration of these systems must be designed, constructed, and operated in a manner that is protective to municipal drinking water sources and consistent with applicable SPP policies. A list of the City's CLI-ECA numbers can be found in Table 1 in Appendix A.

The purpose of this report is to satisfy conditions within the CLI-ECAs requiring the system owner to prepare a 'Significant Drinking Water Threat Assessment for Proposed Alterations.' As required, the report contains the following;

- An outline of the circumstances under which the proposed alterations could pose a Significant Drinking Water Threat based on the Director's Technical Rules established under the CWA.
- An outline of how the system owner assesses the proposed alterations to identify drinking water threats under the CWA.
- For any proposed alteration a list of components, equipment, or sewage works that are being altered and have been identified as a Significant Drinking Water Threat.
- A summary of design considerations and other measures that have been put into place to mitigate risks resulting from construction or operation of the components, equipment or sewage works, such as those included in the Standard Operating Policy for Sewage Works.

This report will be reviewed at least once every 12 months and updated as required. Upon request, a copy of this report will be provided to MECP staff and/or Source Protection Authority (SPA) staff.

2. Significant Drinking Water Threats - Circumstances

Section 1.1 of O Reg 287/07 lists the prescribed drinking water threats under the CWA, and includes 'the establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage'. Proposed alterations that need to be assessed through this process include sanitary sewers and stormwater management facilities, which are sub-threats under this prescribed drinking water threat.

The Region of Waterloo chapter of the SPP defines stormwater management facilities as 'any stormwater infrastructure for the treatment, retention, infiltration or control of stormwater including but not limited to ponds, unlined trenches, etc. but excluding piped stormwater sewers.' If the project does not include construction or alteration of the discharge location and/or treatment, then they are not considered stormwater management facilities under this process and do not need to be included in this assessment.

For each threat, through the Director's Technical Rules, MECP established a set of circumstances that must be met for the activity to be considered a Significant Drinking Water Threat (SDWT). The Director's Technical Rules may be updated, so the current version should be reviewed. In general, sanitary sewers and stormwater management facilities may be SDWTs in the following areas within Waterloo Region.

Threat Sub-Category	Vulnerable Zones
Sanitary sewers and related pipes	WHPA-A, WHPA-B (VS* = 10)
	Nitrate ICA (anywhere)
Stormwater management facility designed to discharge stormwater to land or surface water	WHPA-A, WHPA-B (VS = 10)
	IPZ-1, WHPA-E (VS => 8)
	Chloride, Sodium, Nitrate ICA (anywhere)

* VS = vulnerability score

Where an activity is considered a SDWT, policies under the SPP apply. For a full list of applicable Source Protection Plan policies that may apply to sanitary sewers and stormwater management facilities see Table 2 in Appendix A.

3. Significant Drinking Water Threats - Assessment

The owner of the system is required to assess the proposed alteration to identify potential SDWTs. This process includes the following steps;

1. System owner to determine if the project is located within a Source Protection Vulnerable Area – Wellhead Protection Area (WHPA) or Intake Protection Zone (IPZ).

   Using the MECP Mapping Atlas;
   https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US

   - If the project is not located in a Vulnerable Area (WHPA and/or IPZ), or only within a Significant Groundwater Recharge Area (SGRA) or Highly Vulnerable Aquifer (HVA), activities associated with the project cannot be SDWTs.

2. For projects within Vulnerable Areas (WHPA and/or IPZ) the system owner must provide Region of Waterloo Source Protection staff with relevant project details to determine whether the alteration will constitute a SDWT. Project details to include the following;
   a. Project number
   b. Project location (i.e., road segment)
   c. Project/alteration type
      - Storm sewer (discharge point)
      - Sanitary sewer (wastewater)
      - Wastewater pumping station
      - Stormwater management facility
   d. Project description (brief description on the proposed scope of work)

   Project details should be emailed to Region of Waterloo Source Protection staff at rmo@regionofwaterloo.ca.

3. Region of Waterloo Source Protection staff will review the project details and will notify the system owner if the proposed alteration has been identified as a SDWT.

   Where a SDWT has been identified, the system owner is responsible for outlining how the proposed works will be managed to mitigate the risk of contamination to

drinking water sources through the construction, design, and operation of the proposed alteration (see Section 5).

Additional information on identifying potential SDWTs can be found in the MECP's Design Criteria for Sanitary Sewers, Storm Sewers and Force Mains for Alterations Authorized under an Environmental Compliance Approval – Appendix I (Identification of Risks to Sources of Drinking Water).

4. Significant Drinking Water Threats – Alterations List

The following table contains a list of the components, equipment, and sewage works that have been assessed for the City of Waterloo and have been determined to include a Significant Drinking Water Threat.

Municipality	Year	Project Number	Project Name	Alteration Type
Waterloo	2023	23-11	Keats Way Storm Bypass Sewer Project	Stormwater

A full list of proposed alterations assessed for SDWTs can be found in Table 3 of Appendix A.

5. Significant Drinking Water Threats – Risk Mitigation

Where the proposed alteration is identified as a Significant Drinking Water Threat additional design and operational requirements must be applied to mitigate the risk of the activity to drinking water sources.

Refer to relevant municipal engineering documents, including the Region of Waterloo Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS) document and Area Municipalities design guidelines for design standards, material specifications and construction specifications for sanitary sewers. The latest DGSSMS document can be accessed here;
https://www.regionofwaterloo.ca/en/doing-business/Construction-Design-Standards-and-Guidelines.aspx#Design-Guidelines-and-Supplemental-Specifications-for-Municipal-Services-DGSSMS-

Where sanitary sewers are identified as SDWTs enhanced design features must be applied, which are summarized in section B.1.10 of the DGSSMS. Per policies in the SPP if the sewage work alteration is located within a nitrate ICA and the vulnerability score is 6 or greater, the application must include spill contingency plans.

Additional risk mitigation measures, including minimum design criteria, can be found in the MECP's Design Criteria for Sanitary Sewers, Storm Sewers and Force mains for Alterations Authorized under an Environmental Compliance Approval – Appendix II (Source Protection Standard Operating Policies).

Where stormwater management facilities are identified as SDWTs design and operational requirements must be applied.

The following types of actions may be appropriate in terms of mitigating risks to drinking water sources, depending on the particular stormwater management facility:

- Monitoring conditions (as a minimum) – quantity and quality (e.g., chloride and nitrate) in both surface water and groundwater
- Cleaning out pond sediment for disposal or beneficial re-use
- Install and monitor shallow groundwater monitoring wells to assess leakage
- Lining ponds to prevent leakage
- Risk Management Plans and Salt Management Plans for properties in the drainage area of the SWMF
- Salt Management Plans for municipal roads
- Implementing a winter by-pass for SWMFs that are designed to exfiltrate to the subsurface (e.g., third pipe or infiltration galleries)
- Other recommended risk management measures, and/or best practices, as appropriate (e.g., see the Toronto Region and Conservation Authority's Inspection and Maintenance Guide for Stormwater Management Ponds and Constructed Wetlands)

Additional risk mitigation measures, including minimum design criteria, can be found in the MECP's Design Criteria for Sanitary Sewers, Storm Sewers and Force mains for Alterations Authorized under an Environmental Compliance Approval – Appendix II (Source Protection Standard Operating Policies).

To determine what mitigation measures may be required for a specific stormwater management facility alteration the system owner can contact Region of Waterloo Source Protection staff at rmo@regionofwaterloo.ca.

6. Conclusion

This report satisfies the conditions within the CLI-ECAs requiring system owners to prepare a ‘Significant Drinking Water Threat Assessment for Proposed Alterations.’ This report will be reviewed at least once every 12 months and updated as required. Upon request, a copy of this report will be provided to MECP staff and/or SPA staff.

Sincerely,

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Appendix A

Table 1: CLI-ECA numbers and system type

CLI-ECA Number	Issue Number	Municipality	System Type	Approval Date
112-W601	2	Waterloo	Sanitary	February 8, 2023
112-S701	2	Waterloo	Stormwater	February 8, 2023

Table 2: Potential applicable Source Protection Plan policies

Policy Number	Policy
RW-MC-12	For sanitary sewers and related pipes including pump stations located within the following vulnerable areas and where this activity is or would be a significant drinking water threat, the following policies apply: a. The Ministry of the Environment, Conservation and Parks shall ensure that the Environmental Compliance Approval for existing sanitary sewers and related pipes includes appropriate terms and conditions to ensure that the activity ceases to be a significant drinking water threat within the following areas: i. In Wellhead Protection Areas A and B where the vulnerability is equal to ten (10); ii. Where a Nitrate Issue has been identified, in all Issue Contributing Areas where the vulnerability is greater than or equal to six (6). b. The Ministry of the Environment, Conservation and Parks shall ensure that the Environmental Compliance Approval for new sanitary sewer and related pipes including pumping stations includes appropriate terms and conditions to ensure that the activity does not become a significant drinking water threat in the following areas: i. In Wellhead Protection Areas A and B where the vulnerability is equal to ten (10); ii. Where a Nitrate Issue has been identified, all Issue Contributing Areas where the vulnerability is greater than or equal to six (6).

Policy Number	Policy
	The Environmental Compliance Approval shall include contingency plans for responding to spills as appropriate. Within Wellhead Protection Area A, the Environmental Compliance Approval shall also include enhanced construction to reduce likelihood of leaks.
RW-CW-12.1	The Regional Municipality of Waterloo and Area Municipalities are requested to update their Regional Municipality of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services document within two (2) years from the date the Source Protection Plan takes effect to require enhanced construction standards to ensure that the activity does not become a significant drinking water threat in the following areas: i. In Wellhead Protection Area A
RW-MC-15	For existing discharge from a stormwater management facility within vulnerable areas where this activity is a significant drinking water threat, the Ministry of the Environment, Conservation and Parks, in consultation with the owner of the stormwater management facility and following the completion of the assessment identified in policy RW-CW-19, shall ensure that the Environmental Compliance Approval that governs the stormwater management facility includes appropriate terms and conditions to ensure that the activity ceases to be a significant drinking water threat in the following vulnerable areas: i. In Wellhead Protection Areas A and B where the vulnerability is equal to ten (10); ii. In Wellhead Protection Area E where the vulnerability is greater than or equal to eight (8); iii. In Intake Protection Zones Two (2) and Three (3) where the vulnerability is greater than or equal to eight (8); iv. In Intake Protection Zone One (1); v. Where a Nitrate and/or Chloride Issue has been identified, in all Issue Contributing Areas.
RW-MC-16	To ensure the new discharge from a stormwater management facility does not become a significant drinking water threat within vulnerable areas where this activity would be a significant drinking water threat: a. The Ministry of the Environment, Conservation and Parks shall prohibit the new discharge from a stormwater management facility within the Environmental Compliance Approvals process in the following areas as appropriate:

Policy Number	Policy
	i. In Wellhead Protection Area A; ii. In Intake Protection Zone One (1). b. The Ministry of the Environment, Conservation and Parks shall ensure that the Environmental Compliance Approval that governs the new discharge from a stormwater management facility includes appropriate terms and conditions to ensure the activity does not become a significant drinking water threat when permitted in the following areas as appropriate: i. In Wellhead Protection Area B where the vulnerability is equal to ten (10); ii. In Wellhead Protection Area E where the vulnerability is greater than or equal to eight (8); iii. In Intake Protection Zones Two (2) and Three (3) where the vulnerability is greater than or equal to eight (8); iv. Where a Nitrate and/or Chloride Issue has been identified, in all Issue Contributing Areas except Wellhead Protection Area A. The Environmental Compliance Approval should include, as a minimum, water quality monitoring measures and reporting annually to the Ministry of the Environment, Conservation and Parks, as appropriate. Where there is a Nitrate, and/or Chloride Issue, groundwater and/or surface water quality shall be monitored for Nitrate and Chloride, respectively.
RW-CW-19.1	The Regional Municipality of Waterloo and Area Municipalities are requested to update their Regional Municipality of Waterloo and Area Municipalities Design Guidelines and Supplemental Specifications for Municipal Services document within two (2) years from the date the Source Protection Plan takes effect to require enhanced inspection and testing standards to ensure that stormwater management facilities do not become a significant drinking water threat in the following areas: i. In Wellhead Protection Area A and B where the vulnerability is equal to ten (10)

Table 3: List of proposed alterations assessed to identify potential Significant Drinking Water Threats

Municipality	Project Number	Project Name	Project Description	Project Address	Alteration Type	Identified as a SDWT	Summary of Mitigation Measures for SDWTs
2024							
Waterloo	24-02	Hillcrest Ave	Road reconstruction which includes replacement of underground waste and storm sewers structures.	Hillcrest Ave., Waterloo ON	Reconstruction Project	No	
Waterloo	24-03	Langford Pl. and Quickfall Dr.	Road reconstruction which includes replacement of underground waste and storm sewers structures.	Langford Pl and Quickfall Dr., Waterloo, ON	Reconstruction Project	No	
Waterloo	24-04	90 Margaret Ave.	Wastewater sewer extension approx. 22 m. for wastewater servicing purposes, includes installation of a new MH.	90 Margaret Ave	Sewer Extension	No	
Waterloo	24-05	40 Erbsville Crt.	Wastewater sewer extension approx. 36 m. for wastewater servicing purposes, includes re-benching of existing MH.	40 Erbsville Crt.	Sewer Extension	No	
Waterloo	24-06	Moore Ave. S	Road reconstruction which includes replacement of underground waste and storm sewers structures.	Moore Ave S. from John St. E to Erb St. E	Reconstruction Project part 1	No	
Waterloo	24-07	Moore Ave. S.	Road reconstruction which includes replacement of underground waste and storm sewers structures.	Moore Ave. S. from train tracks to Waterloo St. and Waterloo St. from Roger to Moore Ave. S	Reconstruction Project part 2	No	
2023							
Waterloo	23-02	Teakwood Drive, Teakwood Place, and Thorncrest Drive	Reconstruction which includes replacement of underground waste and storm sewers, structures, two (2) oil/grit separators, and full road reconstruction. During the geotechnical investigation, hydrocarbons were found in the subsurface soils. As a result of these findings, all waste and storm sewer pipes will be specified to be fitted with nitrile gaskets in order to mitigate impact to the sewer network.	Teakwood Drive from Glen Forrest Boulevard to Thorncrest Drive, Teakwood Place from Teakwood Drive to the Cul-De-Sac, and Thorncrest Drive from west of Teakwood Drive to Glen Forrest Boulevard, Waterloo, ON	Sanitary/ Stormwater	No	
Waterloo	23-03	Schaefer Street	Reconstruction which includes replacement of underground waste and storm sewers, structures, (1) oil/grit separator, and full road reconstruction.	Schaefer Street from Weber Street North to end of cul-de-sac, Waterloo, ON.	Sanitary/ Stormwater	No	

Municipality	Project Number	Project Name	Project Description	Project Address	Alteration Type	Identified as a SDWT	Summary of Mitigation Measures for SDWTs
Waterloo	23-11	Keats Way Storm Bypass Sewer Project	Installation of a bypass storm sewer. The bypass sewer is intended to reduce the frequency and severity of flooding experienced by certain properties on Keats Walk and Keatsway Place where the existing storm sewer system daylights into a channel in the rear yards of properties on those two cul-de-sacs. Storm flows in the existing sewer will be split between the existing channel and the proposed storm bypass sewer.	Keats Way from Keats/Karen Walk to the Clair Creek culvert just east of McDougall Road, Waterloo, ON.	Stormwater	Yes	