Appendix 6-6

Lemieux Island Water Purification Plant Intake Improvement – Summary of Source Protection Risk Assessment in Quebec; Ontario versus Quebec Regulations

Mississippi-Rideau Source Protection Region

Technical Memorandum

Subject:	Lemieux Island Water Purification Plant Intake Improvement – Summary of Source Protection Risk Assessment in Quebec; Ontario versus Quebec Regulations
Attention:	Mississippi-Rideau Source Protection Region (MR-SPR); and Ontario Ministry of Environment, Conservation and Parks (MECP)
From:	City of Ottawa
Date:	January 13, 2022

1. Background

A new intake for the Lemieux Island Water Purification Plant (WPP) is proposed due to issues related to frazzle ice at the existing intake, which is located within the Ottawa River near the shoreline of Lemieux Island. The new proposed intake location will be situated in deeper water on the Quebec side of the Ottawa River, as such Quebec regulations with respect to the water withdrawal apply. It is important to the City that the source water for the new Lemieux Island WPP intake be protected for the long-term operation of the intake.

Within Ontario, drinking water source protection is regulated under the *Clean Water Act*, administered by the Ontario Ministry of Environment, Conservation and Parks (MECP). Under the *Act*, all municipal residential drinking water sources are required to have delineated Drinking Water Protection Zones based on Technical Rules under the *Clean Water Act*; this includes Intake Protection Zones (IPZs) for surface water sources and Wellhead Protection Areas (WHPAs) for groundwater sources. Source water protection policies outlined in locally developed Source Protection Plans are required to be implemented within IPZs and WHPAs to ensure that there are no significant drinking water threats or that significant drinking water threats are appropriately managed to protect the drinking water supply from contamination and depletion.

The existing intake for the Lemieux Island WPP is located within the Mississippi-Rideau Source Protection Region. The Lemieux Island WPP IPZ within Ontario is delineated in the Mississippi-Rideau Source Protection Plan. Source Protection Plan policies apply within the IPZ in Ontario and have been in effect since January 1, 2015.

Ontario's *Clean Water Act* does not apply within Quebec; however regulated protection of the source water to the new intake is desired by the City of Ottawa to ensure the long-term safety of the drinking water supply. Discussions with staff at the MELCC identified that the City may request the implementation of Quebec's *Water Withdrawal and Protection Regulation* or other measures in addition to the *Regulation* (request to be reviewed and implemented at the discretion of the MELCC). In order to determine the level of source protection regulation to request from the MELCC, the City of Ottawa commissioned a risk assessment study to compare the regulated areas and activities under Ontario versus Quebec legislations.

This memo provides a summary of the report prepared by JFSA Water Resources and Environmental Consultants, commissioned by the City of Ottawa to compare Ontario's *Clean Water Act* the Quebec's *Water Withdrawal and Protection Regulation* as they relate to existing threats that may impact the new Lemieux Island WPP intake.

2. Comparison on Ontario and Quebec Source Water Protection Regulations:

A review of Quebec's *Water Withdrawal and Protection Regulation* versus local Source Protection Plan policies developed under the Ontario's *Clean Water Act* was completed to determine differences between areas where policies apply, regulated activities, and the management of potential drinking water threats. Risks associated with differences between regulated areas and activities have been analyzed and are summarized in the report entitled: *Risk Assessment Related to the New Lemieux Water Intake*, prepared by JFSA Water Resources and Environmental Consultants, dated December 6, 2021 (herein referred to as the JFSA Report).

Conclusions from the JFSA Report are summarized below:

1. Ontario's source protection regulations are some of the most ambitious in Canada, and the results of the risk analysis for the Lemieux Island WPP indicate that the Quebec regulations are generally comparable for the Lemieux intake. The risk factor of implementing either the Ontario or Quebec regulation is low.

2. There are some differences in drinking water threats that are regulated between the two Provincial legislations. A comparison of regulations is provided within the JFSA Report in the context of potential future activities. In general, there is no specific activity listed in Quebec or Ontario's source protection regulations that is not managed by the other province's source protection regulation or under another provincial mechanism, as applicable within the study area.

3. Protection zones where policies apply were delineated within Quebec for the new Lemieux Island WPP intake based on the Ontario and Quebec regulations, this includes IPZ-1 and IPZ-2 based on Ontario's *Clean Water Act* and the Inner and Intermediate Protection Zones based on Quebec's *Water Withdrawal and Protection Regulation*. The protection zones delineated using the Quebec and Ontario methodology are presented in JFSA Report Figure 3 (IPZ-1 and Inner Protection Zones) and Figure 4 (IPZ-2 and Intermediate Protection Zones), attached.

4. Existing potential threat activities that may be considered a significant drinking water threat under the *Clean Water Act* were identified within the IPZ-1 and IPZ-2, they include: the application of pesticides or fertilizer (golf courses, high tension power line corridors), storage or fuel (gas stations, garages, residential fuel tanks), septic systems, storm sewer outlets, combined sewer outlets, and contaminated soils. Locations of the potential threat activities are shown in JFSA Report Figure 8 (attached). All the existing potential threat activities either do not meet the circumstances to be considered a significant drinking water threat or the activity is managed by the MELCC under the source protection regulation or another regulation.

However, there are a few noteworthy potential threat activities that are not regulated in Quebec's intermediate protection zone but are present within the IPZ-2, outlined below.

a. High-tension power line corridors (within IPZ-1, IPZ-2 and the Intermediate Protection Zone): Tree removal and vegetation control within high-tension power line corridors is achieved by Hydro-Quebec through both mechanical and chemical methods; pesticide use may be considered a significant drinking water threat under the *Clean Water Act* under certain circumstances. The use of pesticides was investigated, and it was determined that the type of pesticides applied and the land area where pesticides are applied do not meet the circumstance to be considered a significant drinking water threat under the *Clean Water Act*, thus the activity is not considered a threat.

b. Golf courses (within IPZ-2 and the Intermediate Protection Zone): Golf courses use fertilizer for landscaping; the activity could be considered a significant drinking water threat under Ontario's *Clean Water Act* if agricultural source material (ASM) or nonagricultural source material (NASM) are applied or stored within the drinking water protection zone. Communication with several of the golf courses within the protection zone confirmed the use of commercial fertilizer (not ASM or NASM), which is not considered a significant drinking water threat within the IPZ-2. Not all the golf courses were reached, but the threat is considered low since it is likely that commercial fertilizer is similarly used at all the golf courses.

c. Presence of contaminated sites (within IPZ-2 and the Intermediate Protection Zone): Contaminated sites are regulated within the Intermediate Protection Zone under Quebec's regulation. Two contaminated sites were identified within the IPZ-2 that are not within the Intermediate Protection Zone. The risk is considered low since the connectivity of the sites to the waterways remains uncertain, contaminated sites are managed by other Provincial Instruments in Quebec, and contaminated sites are not considered a significant drinking water threat under Ontario's *Clean Water Act*.

5. Other noteworthy findings related to the risk assessment:
   a. Combined sewer outfalls (within IPZ-2): Two combined sewer outfalls (CSO) are located within the IPZ-2 and would be considered significant drinking water threats under the *Clean Water Act*. These are subject to standards (# of events per year) determined by the MELCC and are monitored by the MELCC, thus the threat could be considered managed, and the risk is considered low.

      However, it is worth noting that 9 events occurred at outfall H-41 in 2018, which exceeded the standard (4 events from May 1 to September 30, which will be increased to 7 as of 2022). Based on communication with the City of Gatineau, the outfall was unusually sensitive to the rain events in 2018. Thus, close attention should be paid in the future by the MELCC to maintain the standard so that this structure is not a threat to drinking water. The other combined sewer outfall H-26 met the standard (6 events from June 1 to September 30) and was not exceeded between 2017 and 2020.

b. Planned Des Fees Creek stormwater outfall: The City of Gatineau is planning on deviating the outfall of the Des Fees Creek towards the Ottawa River instead of the De la Brasserie Creek, the new outfall would be immediately upstream of the proposed intake within the Inner Protection Zone and IPZ-1 (shown in JFSA Report Figure 8, attached). The proposed outfall will not have any treatment, but it is understood that the City of Gatineau is responsible to ensure that the new outlet will not be a threat to the proposed Lemieux Island WPP intake. It is noted that the City of Gatineau has commissioned a consultant to complete a hydrodynamic study to model the mixing downstream of the proposed outfall and evaluate the potential threat to the new intake. It is understood that the MELCC will review the proposal and will ensure that the outfall will not be considered a significant threat to the proposed Lemieux Island WPP intake.

c. Prince of Wales railway bridge: The Prince of Wales railway bridge crosses within the Inner Protection Zone and the IPZ-1. The bridge is being converted to a multi-use pathway, mainly for cycling, recreational use and pedestrians. A new wood deck will be constructed on top of the existing rail track and it is understood that the bridge may still be used in the future as a rail bridge. It is unlikely that there would be a potential catastrophic chemical spill from the railway bridge. Nonetheless, computational fluid dynamic modelling was conducted to assess the risk at the intake in the event of a spill from the bridge (reference: *Jacobs, 2019. Technical Memorandum no.8, Lemieux Island Water Purification Plan Intake Improvement – Assessment of Alternative Intake Location*). Results indicate that there would not be any impact at the intake in the event of a fuel oil spill from the bridge, however other types of contaminants (i.e. acid) spilled from the bridge may reach the intake under certain circumstances. The risk at the intake of a catastrophic chemical spill is considered low.

6. Overall, potential drinking water threats would be comparably managed by implementing Quebec's *Water Withdrawal and Protection Regulation* or Ontario's *Clean Water Act* for the new Lemieux Island WPP Intake. Although there are some differences between the areas where policies apply and how specific activities are managed, the overall risk to the intake is considered low.

3. Conclusion:

An assessment has been completed to investigate the risk of implementing either the Ontario or Quebec source protection regulations with respect to the new intake for the Lemieux Island WPP. The assessment found that significant drinking water threats are comparably managed by implementing either the Ontario or the Quebec regulations.

Furthermore, source protection policies are not currently implemented within Quebec for the existing intake at the Lemieux Island WPP. Therefore, implementing source protection policies in Quebec for the new intake is more protective than current measures at the existing intake which exclusively apply *Clean Water Act* regulations within Ontario.

Attachments:

Select JFSA Report Figures

Figure 3 : Spatial comparison of the IPZ-1 and the immediate protection zone

IPZ-2 and Intermediate Protection Zone comparison - Quebec side

Legend

- Tributaries
- Planned Des Fées Creek deviation
- Planned water intake
- IPZ-2 (ON)
- Intermediate protection zone (QC)
- Storm sewer outfalls within IPZ-2

Source: Google Earth satellite imagery (2018)

By: JFSA Ressources hydriques et environnement

Client: Ottawa

Project:

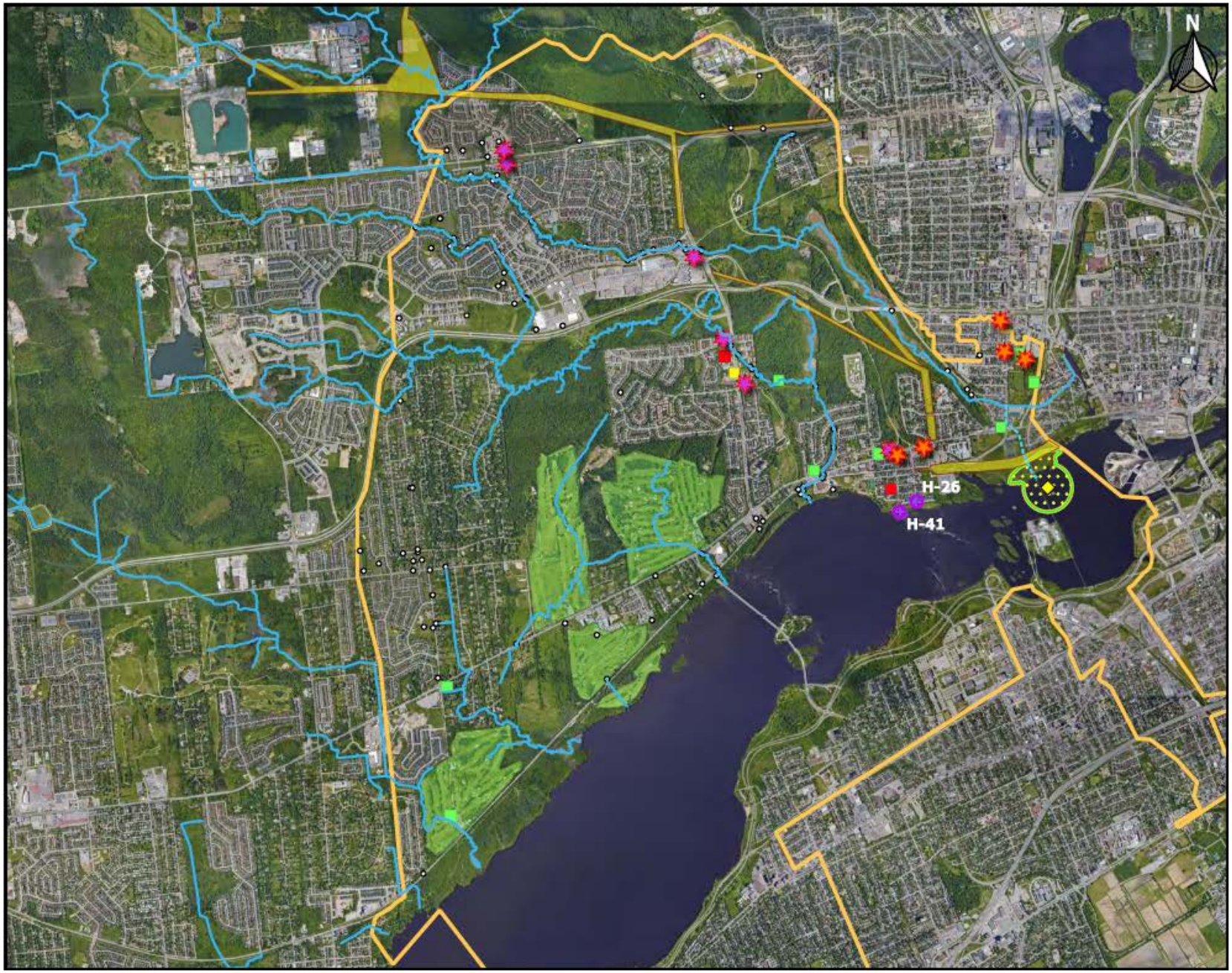
Risk assessment related to the new Lemieux Island water intake

No.	PAR.	DATE	DESCRIPTION	APPR.

Scale: 0 400 800 1,200 1,600 m

Figure 4

CONÇU: AP	
DESSINÉ: AP	
VÉRIFIÉ: AM	
APPROUVÉ: JPS	
DATE	PROJECT
6/12/2021	2091



Regulated activities within the IPZ-2 protection zone (Qc)

Legend

- Tributaries
- Planned Des Fées Creek deviation
- Planned water intake
- IPZ-2 (ON)
- Storm sewer outfalls
- Combined sewer outfalls
- Gas stations and garages
- Golf courses
- High-tension power line corridors

Contaminated sites (MELCC)

- Remediation completed
- Remediation started
- Remediation not started

Source: Google Earth satellite imagery (2018)

By: JFSA Ressources hydriques et environnement

Client: Ottawa

Project:

Risk assessment related to the new Lemieux Island water intake

No	PAR	DATE	DESCRIPTION	APPR.

Scale: 0 300 600 900 1,200 m

Figure 8

CONÇU: AP	
DESSINÉ: AP	
VÉRIFIÉ: AM	
APPROUVÉ: JFS	
DATE	PROJECT
6/12/2021	2091