



GUIDING SOLUTIONS IN THE
NATURAL ENVIRONMENT

Wetland Water Balance Risk Assessment

**3225 5th Concession Road,
City of Pickering**

Prepared For:

869547 Ontario Inc.

Prepared By:

Beacon Environmental Limited & Candevcon East Limited

Date: Project:

September 2023 221050

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1. Introduction

The Wetland Water Balance Risk Evaluation (TRCA 2017) supports the Toronto and Region Conservation Authority (TRCA) Stormwater Management Criteria 2012 document that describes requirements for proposals to maintain the water balance of natural features designated for protection. This Risk Evaluation has been prepared by Beacon Environmental Limited (Beacon) with input and analysis from Candevcon East Limited (Candevcon) and R.J. Burnside & Associates (Burnside) for the proposed development at 3225 5th Concession Road, Pickering (hereinafter “subject property”; **Figure 1**). The subject property is located on the east side of Balsam Road, north of 5th Concession Road and west of Audley Road and has a total area of 17.9 ha. The Risk Evaluation was developed to aid proponents in determining the level of risk that a proposed activity, such as development, may have on the ecological integrity of a wetland as a result of potential changes to its hydrology. The level of risk assigned to the proposed activity determines the scope of the feature-based water balance analysis and future monitoring that is then required.

The Risk Evaluation defines impacts to wetland water balance as occurring under the following circumstances:

- When there is alteration to the surface water catchment of a wetland determined to be protected; and
- When water taking requiring Ministry of Environment, Conservation and Parks (MECP) Environmental Activity and Sector Registry (EASR) registration or a Permit to Take Water (PTTW) (i.e., > 50,000 L/day) is anticipated within the surface water catchment of a wetland or on a property that contains a wetland determined to be protected.

In order to determine the level of risk, the following four-step process is applied:

- Step 1. Determine which retained wetland(s) may be impacted by the proposal;
- Step 2. Determine the magnitude of potential hydrological change;
- Step 3. Determine the sensitivity of the wetland and its associated flora and fauna to hydrological change; and
- Step 4. Integrate information from Step 1, 2, and 3 to assign a level of risk to the proposal.

2. Wetland Risk Assessment

2.1 Determine the Potentially Affected Wetlands (Step 1)

In accordance with TRCA comments, this evaluation addresses one wetland community that is located within the Carruthers Creek valley corridor. The wetland is depicted in the companion Environmental Impact Study (EIS) prepared by Beacon (2023). This community is visualized in **Figure 2** and is described within the body of the EIS report.

The subject property is undeveloped and is bisected by a portion Carruthers Creek and associated treed valleyland. Carruthers Creek drains a total area of 38.4 km² and captures portions of the City of Pickering and Town of Ajax within Durham Region (TRCA 2002).

The subject property contains meadow communities and both woodland and wetland communities are located within the valley corridor in the central portion of the property. The subject property is within the jurisdiction of the TRCA. It is our understanding that MECP has classified Carruthers Creek within the subject lands as occupied Redside Dace (*Clinostomus elongatus*) habitat, a provincially and federally endangered fish species.

A mixed swamp (SWM1-1) community (**Figure 2**) was assessed in the field by Beacon ecologists on July 15, 2021. This is a riparian wetland community along the western tributary to Carruthers Creek in the northern portion of the property. This community has a mixed canopy of White Cedar (*Thuja occidentalis*), Yellow Birch (*Betula alleghanensis*) and White Birch (*Betula papyrifera*). All trees are less than 50 cm in diameter and the canopy is slightly open. The understory and ground flora are sparse and include Red-Osier Dogwood (*Cornus stolonifera*), Sensitive Fern (*Onoclea sensibilis*), Water Plantain (*Alisma subcordatum*), Spotted Jewelweed (*Impatiens capensis*), and Watercress (*Nasturtium officinale*). The area of this community is approximately 0.18 ha and it is greater than 30 m from the proposed development. This wetland community has been delineated using Ecological Land Classification (ELC) data and has not been staked in the field with the agencies as it was not expected that this feature would be directly impacted by the proposed development as it is within a larger valley corridor that will be maintained and buffered.

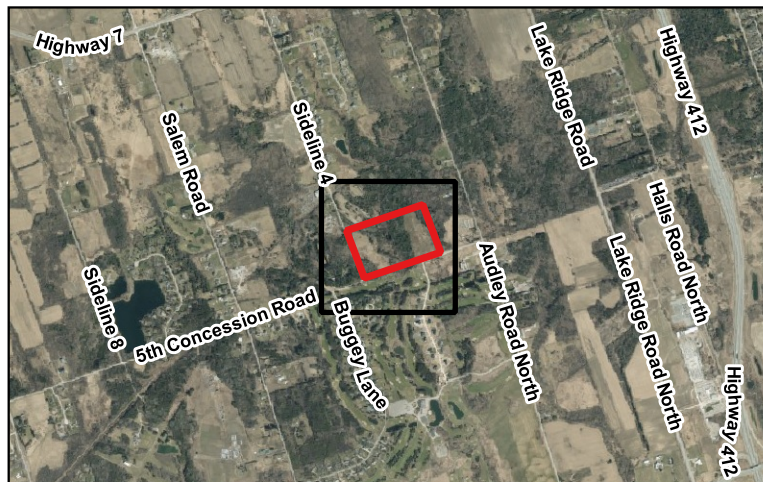
2.2 Determine the Magnitude of Potential Hydrological Change (Step 2)



Calculations completed as part of Step 2 for determining the magnitude of potential hydrological change.

The Risk Evaluation requires the use of the following criteria to evaluate the magnitude of potential hydrological impact that a proposal may have on a wetland:

- The proportion of impervious cover in the catchment of the wetland that would result from the proposal;
- The degree of change in the size of the wetland catchment;
- Water taking from, or discharge to, surface water bodies or aquifers directly connected to the wetland; and
- The impact on locally significant recharge areas.

The results of Step 2 are summarized below in **Table 1** and **Table 2**. **Table 1** provides a summary of the hydrological data required to complete this step of the risk evaluation and **Table 2** provides the criteria used to evaluate the probability and magnitude of hydrological change.



Site Location		Figure 1	
Frisque EIS			
		Project: 221050 Last Revised: September 2023	
Client: 869547 Ontario Inc.		Prepared by: BD Checked by: KQ	
	1:4,800	Inset Map: 1:50,000	
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Frisque EIS

Legend

- Subject Property
- Ecological Communities
- Staked Feature Limit (TRCA, August 2021)
- Watercourse (Beacon 2022)
- Contours
- Contributing Redside Dace Habitat
- Meander Belt (Beacon 2023)
- Limit of Redside Dace Occupied Habitat (Meander Belt + 30 m)

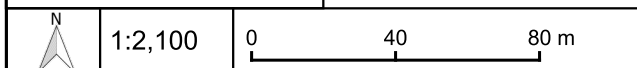
Code	Wetland Communities
SWM1-1	White Cedar - Hardwood Mineral Mixed Swamp
Forest Communities	
FOC4-1	Fresh - Moist White Cedar Coniferous Forest
FOD7	Fresh - Moist Lowland Deciduous Forest
FOM4-2	Dry - Fresh White Cedar - Aspen Mixed Forest
FOM6-1	Fresh - Moist Sugar Maple - Hemlock Mixed Forest
Cultural Communities	
CUM1-1	Dry - Moist Old Field Meadow
CUP3	Coniferous Plantations
Other Communities	
HE	Hedgerow



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Table 1. Magnitude of Potential Hydrological change

Data	Wetland	Units	Data Source/Notes
Wetland feature limits	0.18	ha	Beacon
Extent and size of pre-development catchment (C)	2.39	ha	Candevcon
Total development area of catchment (Cdev)	0.27	ha	Candevcon
Area of the wetland catchment owned by the proponent	0.18	ha	Candevcon
Percent of impervious cover planned within the proponent's holdings (IC)	13%	%	Candevcon
Proposed extent and size of post-development catchment	2.63	ha	Candevcon
Anticipated magnitude and duration of water taking	< 400,000L/day for < 6 months	--	Burnside
Location and extent of any locally significant recharge areas	Northwest and east portions of property ¹	--	Burnside

1, The Ontario Source Protection Atlas identifies Significant Groundwater Recharge Areas (SGRAs) on portions of the subject property located west of Carruthers Creek and Ecologically Significant Groundwater Recharge Areas (ESGRAs) located on the majority of the subject property east of Carruthers Creek. The water balance calculations estimate the impervious area to be less than 10% of the catchment areas associated with the SGRA and ESGRA (Burnside 2023).

Table 2. Criteria Used to Evaluate the Probability and Magnitude of Hydrological Change

Criteria	Wetland	Data Source/Notes
Impervious cover score (S) within catchment	Low	Candevcon
Increase or decrease in catchment size	Low	Candevcon
Water taking or discharge	Low	Burnside
Impact to recharge areas	Low	Burnside
Magnitude of Hydrologic Change	Low	TRCA (2017)

2.3 Determine the Sensitivity of the Wetland (Step 3)

The Risk Evaluation assesses the sensitivity of a wetland based on the abiotic and biotic characteristics of the wetland that are directly related to hydrology and/or ecology. To assess the sensitivity of the wetland community, hydrological change was assessed based on five criteria discussed in this section.

The components of this section have been extrapolated from the September 2023 EIS (Beacon) and includes data from the most recent field visits (i.e., 2021).

2.3.1 Vegetation Community

Based on the findings of the EIS prepared for the study area by Beacon (2023), the wetland unit involved in this analysis was classified according to ELC for southern Ontario as:

- White Cedar – Hardwood Mineral Mixed Swamp (SWM1-1).

Referencing Appendix 2 of the Wetland Water Balance Risk Evaluation (TRCA 2017), this ELC community type is classified as Medium Sensitivity. This community is tolerant of slight hydrological change (TRCA 2017).

2.3.2 Fauna Species

No seasonal surveys for fauna were conducted at this wetland given its location within the valley corridor that will be protected and buffered from the proposed estate residential subdivision.

The risk evaluation document notes that the individual species with the highest sensitivity level determines the sensitivity of the fauna community to hydrological change. As the surveys confirmed the potential for vernal pools to be present in the spring and potential habitat for breeding amphibians and in the absence of seasonal survey data, the highest level of sensitivity has been applied to this wetland. On this basis, this wetland unit is ranked High Sensitivity.

2.3.3 Flora Species

The EIS (Beacon 2023) documented one medium sensitivity flora species specifically Sensitive Fern, per Appendix 3 of the Risk Evaluation (TRCA 2017). The remainder of the flora species that were documented in the wetland were either low sensitivity, Water Plantain or species that are not included in Appendix 3. As the community has no high sensitivity species, and does not have multiple medium sensitivity species and the majority of species either low or are not listed as low sensitivity category is met wetland is ranked Low Sensitivity.

2.3.4 Significant Wildlife Habitat for Hydrologically Sensitive Species

Wetlands have the potential to provide critical wildlife habitat for a variety of species, including those that are difficult to detect, are locally rare, cryptic or are used seasonally. In recognition of the significant habitat wetlands may provide and the potential for species to be overlooked during surveys, the conservation authority exercises the precautionary principle that any species with a high sensitivity ranking requires increased protection.

The City of Pickering has not designated the feature as significant wildlife habitat (SWH). However, the wetland may meet the criteria to be considered SWH for amphibian breeding habitat as noted in the EIS (Beacon 2023).

Therefore, a Medium Sensitivity classification has been applied to the wetland with respect to SWH.

2.3.5 Wetland Sensitivity to Hydrological Change

The wetland is classified as a riverine wetland because the western tributary to Carruthers Creek flows through this wetland (**Figure 2**). Therefore, this wetland feature is within the floodplain and present due to the proximity of the watercourse which likely encourages the wetland conditions. Based on this wetland being classified as a riverine wetland, it is Low Sensitivity per Table 3 of the Risk Evaluation (TRCA 2017).

2.4 Risk Characterization (Step 4)

The Risk Evaluation uses a decision tree to categorize the proposed activity into one of three possible levels of risk: Low, Medium, or High. This chart is presented in **Appendix A** for reference.

Table 3. Results of the Wetland Water Balance Risk Evaluation

Criteria	Wetland
Magnitude of Hydrological Change	Low
Wetland Sensitivity to Hydrologic Change	Medium
Overall Risk Assignment	Low

As per the results presented in **Table 3** and based on the assessments provided in Sections 2.2 and 2.3 of this report (i.e., magnitude of potential hydrological change and wetland sensitivity), this wetland has been determined to be **Low Risk**.

3. Conclusion

Beacon has conducted a wetland risk assessment in accordance with TRCA’s Wetland Water Balance Risk Evaluation (2017) using data collected under the natural heritage field program undertaken by Beacon (September 2022) and hydrological data provided by Candevcon (July 2023) and Burnside (2023).

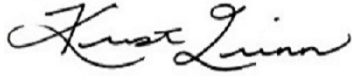
Based on the results of the wetland risk evaluation provided in this report, the wetland community was determined to be **Low Risk**, as it is unlikely that the proposed development will have a substantial impact on wetland hydrology for this wetland community.

Based on this **Low Risk** classification, monitoring is not required as outlined in the Wetland Water Balance Monitoring Protocol (TRCA 2016). However, the following are required:

- Non-continuous hydrological model (e.g., Thornthwaite Mather) with output at monthly or higher resolution; and
- A mitigation plan to maintain water balance to wetland as outlined in Stormwater Management Criteria Document (TRCA 2012; see overall objective for wetlands).

Should you have any questions regarding this assessment, please do not hesitate to contact the undersigned.

Prepared by:
Beacon Environmental



Kristi Quinn, B.E.S., Cert. Env. Assessment
Principal, Senior Environmental Planner

Reviewed by:
Beacon Environmental



Jesse Campbell, B.Sc., Cert. Eco. Restoration
Senior Ecologist,
ISA Certified Arborist (ON-1540A)

4. References

- Beacon Environmental Limited. 2023.
Environmental Impact Study, 3225 5th Concession Road, City of Pickering. September 2023.
- Candevcon East Limited. 2023.
Frisque Lands 3225 5th Concession Road, City of Pickering, Region of Durham. Functional Servicing and Stormwater Management Report. July 2023.
- R.J. Burnside & Associates. 2023.
Frisque Lands Updated Water Balance Assessment. August 2023.
- Toronto and Region Conservation Authority (TRCA). 2017.
Wetland Water Balance Risk Evaluation. November 2017.

Appendix A

Wetland Risk Assessment Decision Tree

Appendix A

Wetland Risk Assessment Decision Tree

