



**CN Milton Logistics Hub: Wetlands
Follow-up Program**

October 22, 2021

File: 160960844

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Abbreviations

CH	Conservation Halton
DFO	Department of Fisheries and Oceans
ECCC	Environment and Climate Change Canada
ha	hectare
IAAC	Impact Assessment Agency of Canada
PDA	Project Development Area



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General
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1.0 GENERAL

This document outlines the follow-up program for wetlands in relation to construction and operation of the Milton Logistics Hub.

The wetland monitoring program presented below, and the associated monitoring details, have been developed to comply with the conditions of approval in the Minister of the Environment's Decision Statement issued January 21, 2021. This program has developed to comply with Condition 6.3 of the Decision Statement and has been developed in consultation with Environmental and Climate Change Canada (ECCC), Conservation Halton (CH) and other relevant authorities as applicable. Draft versions of this FUP were provided to ECCC on August 10, 2020, CH on July 31, 2020, and the MECP on June 7, 2021. Comments were received from the ECCC and have been considered in finalizing this document. Any revisions and manner by which comments were addressed, including corresponding rationale, were communicated to those who responded to CN's request for input.

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Program Design Considerations
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2.0 PROGRAM DESIGN CONSIDERATIONS

A follow up program for wetlands will be implemented post construction to verify the accuracy of the environmental assessment and determine the effectiveness of proposed mitigation measures.

In accordance with Condition 6.3 of the Decision Statement, the program will consist of the following components:

1. Monitoring of the extent (area) of wetlands within the Project Development Area (PDA).
2. Monitor the areal extent and encroachment by invasive vegetation species and success of native vegetation planting for all retained and constructed wetlands located within the PDA
3. Monitor water level fluctuations in all retained and constructed wetlands located within the PDA and compare monitoring results against baseline fluctuations
4. Develop and implement modified or additional mitigation measures if the results of the monitoring indicate that modified or additional mitigation measures are required to maintain or increase the total areal extent of wetlands within the PDA and retained and constructed wetlands maintain their functions over time.
5. Assess if additional monitoring is required after the first five years following the end of construction, including the duration of that additional monitoring.

3.0 FOLLOW-UP PROGRAM FOR WETLANDS DURING POST-CONSTRUCTION/OPERATIONS

The purpose of the wetland follow-up program is to confirm long-term viability of the identified wetlands and to confirm the newly created wetlands are functioning as intended.

3.1 CRITERIA

The follow-up program will be implemented to evaluate the success of the newly created wetlands by evaluating the following:

- Areal extent of retained and constructed wetlands
- Encroachment of invasive species
- Restoration success of native vegetation and plantings
- Wetland water level fluctuations as compared to pre-construction conditions
- Occupation by wildlife species

3.2 LOCATIONS

The conceptual habitat enhancement plan proposes the creation of four areas of wetland habitat on CN-owned lands, comprising 7.1 ha of wetland habitat:

- New creek channels for Tributary A and Indian Creek
 - These will provide lotic habitat for wetland migratory birds, turtles and other wildlife. The new channels will act as a movement corridor connecting the different created habitats on site, as well as habitats upstream and downstream of the site along the Indian Creek corridor.
 - These will replace movement corridor function of the current creeks. The new channels have been designed with a sequence of riffles and pools, with the use of logs and root wads to help create the riffles, riparian vegetation and log tangles to provide cover along the length of the channel for turtles moving through these habitats.
- Retained oxbow wetland along Indian Creek
 - The retained oxbow wetland will provide breeding and staging habitat for migratory birds, foraging habitat for turtles, as well as opportunities for basking and cover, in addition to habitat for other wildlife. Existing vegetation will be retained and allowed to succeed over time as soil moisture conditions change.

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- Riparian meadow marsh
 - A mix of native wetland grasses and forbs will be planted to provide breeding habitat for wetland migratory birds, foraging habitat for reptiles and amphibians, monarch habitat, as well as habitat for other wildlife. Log piles will be constructed in the open areas to provide additional cover.
- Riparian wetlands comprising 12 small, shallow marsh wetlands along the new channel for Tributary A, and four larger wetlands along Indian Creek
 - The shallow water marshes will include a mix of emergent and riparian native wetland plants, and open water. They will provide new habitat for migratory wetland birds, supporting existing species in the PDA (e.g., Red-winged Blackbird and Spotted Sandpiper), as well as a greater number and variety of breeding wetland migratory birds than the existing wetlands, including waterfowl. Planting schemes for each riparian wetland are identified in Appendix B (L-500 and L-501, C-200 (C-200, C-201, C-210, C212) and C-400 series drawings).
 - The shallow and open water marshes will also provide foraging habitat for Snapping Turtle. Plugs of emergent and floating vegetation will be planted along the wetland edges, including species such as water-plantain, wild calla, tussock sedge, little duckweed, broad-leaved arrowhead and water smartweed. Logs for basking will be placed both in the water and along the shoreline.
 - The shallow water marshes will provide breeding habitat for amphibians. The off-channel wetland pockets are expected to be fishless, providing suitable habitat for amphibian such as salamanders and Western Chorus Frog, which require fishless breeding habitat.

3.3 METHOD

Riparian vegetation establishment will be assessed by a terrestrial biologist or landscape architect with experience in post-construction monitoring. This will include assessment of planted and naturally regenerating vegetation.

3.3.1 Riparian Vegetation Assessment

In conjunction with the fish and fish habitat monitoring associated with the realigned channels, riparian vegetation monitoring will be undertaken to assess the success of native vegetation planting and the overall vegetative cover including planted and naturally regenerating vegetation. The five-year monitoring program includes the following parameters:

- Annually (Years 0, 1, 2, 3, and 5 after construction): Riparian vegetation establishment will be assessed
- Year 0: Verify installation of plant materials as per planting plan and set the baseline for the 3-year monitoring program
- Year 1, 2: Vegetation assessment per contract warrantee maintenance clause

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- Year 3 and 5: Visual assessment of vegetation as it relates to stability of the realignment of channels

Using appropriate survey techniques, restored areas will be surveyed to document and assess the vegetation characteristics as outlined below.

- **Fixed Plot Monitoring:** Species observed within the plot will be recorded, along with their estimated abundance. Species composition will be compared to the previous years' data to identify shifts in dominance, diversity, germination and development success of manually seeded species, mortality observations, presence of invasive species, presence and health of shrub species, and documentation of tree species establishment. Data will be collected in sufficient detail to establish benchmarks for percent invasive species, average Coefficient of Wetness, average Coefficient of Conservatism and Floristic Quality index.
- **Ground Cover:** Targets for the establishment of groundcover include the presence of native grasses and forbs representative of the restoration seed mix.
- **Woody Vegetation:** Trees and shrubs will be monitored for survival and general health, as an indicator of successful establishment and growth. Numeric counts of tree and shrub survival will be undertaken with a two-year target of 80% survival taking into consideration natural regeneration.
- **Photographs:** Photographs will be taken at standard locations at each monitoring visit to document establishment and growth of plants.

3.3.2 Wetland Areal Extent Evaluation

The extent of wetlands within the PDA will be delineated in accordance with the Southern Ontario Manual of the Ontario Wetland Evaluation System (OWES) (MNRF, 2013). The OWES system uses vegetation and soils to assess wetland boundaries. However, as the created wetlands will be on graded areas, and without gleys and mottles, soil layers would not be representative of the hydrologic conditions of the site. As such, wetland delineation will be based on a vegetation assessment. OWES uses the 50% rule, defining wetlands as vegetation communities with more than relatively 50% cover of wetland plant species.

- Wetland boundaries will be assessed annually for five years (Years 1, 2, 3, 4 and 5 after construction).
- Assessing the relative percent cover of vegetation species and recording natural succession of non-wetland species.
- Wetland boundaries will be flagged and marked with a submeter Global Positioning System (GPS), to provide an accurate measurement of wetland size.

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3.3.3 Wetland Water Level Fluctuations

In addition to monitoring the extent of the wetlands, water level fluctuations within both retained and created wetlands will also be monitored. Water level monitoring will take place three times annually (spring, summer and fall) using photographs from standard locations to document water in the created wetlands for the monitoring period of five years.

These qualitative observations will be supported by installation of strategically placed drive-point piezometers designed to allow for the installation of dataloggers to monitor wetland hydroperiods.

3.3.4 Invasive Species Monitoring

An invasive species monitoring program will be implemented with emphasis on identifying areas of reed canary grass encroachment.

A botanical inventory will be conducted between late June and July in each year for five years after construction for invasive species. Area searches will be conducted to provide comprehensive coverage of the created wetlands within the PDA. Areas of invasive species will be delineated using a GPS. If establishment of invasive species such as reed canary grass is observed to exceed 30% cover of the plot (i.e., absolute cover, as opposed to relative cover), adaptive management measures will be implemented to reduce or eliminate the species from the restoration area. Control measures will be developed in consultation with ECCC and further monitoring may be required.

3.3.5 Wildlife Monitoring

Breeding Birds

Breeding bird monitoring will be completed to assess presence, abundance and breeding evidence of wetland migratory birds within the wetland compensation habitat over a period of five years, post construction. Three rounds of surveys per year will be completed by a qualified ecologist during the core breeding period (June-early July) spaced at least one week apart. Each survey will consist of transects and point counts. Transects will be traversed crossing the wetland compensation habitat lengthwise, with point count stations at 250m intervals. Ten-minute point counts will be conducted at each station on each survey date. Bird observations will be recorded at four distance categories: within a 50 m radius, 50 to 100 m, outside the 100 m radius and flyovers.

Transects and station locations will be determined on the first field visit based on site conditions as required, following the intervals and distances described above. For each point count and transect (start point and end point), the start time and location will be recorded (using a hand-held GPS unit). The same locations will be surveyed in each of the five years.

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Amphibians

Calling amphibian surveys will be conducted over a period of five years post-construction, following the protocols identified in the *Marsh Monitoring Program Manual* (Bird Studies Canada, 2008). The protocol involves the surveyor standing at selected station and listening for three minutes. Station locations will be determined on the first field visit based on site conditions as required. Amphibians will be recorded within each surveyed station if they are within 100 m of the surveyor. Consistent with the Marsh Monitoring Program protocol, calling activity will be ranked using one of the following three (3) abundance code categories:

1. calls not simultaneous – number of individuals can be accurately counted
2. some calls simultaneous – number of individuals can be reliably estimated
3. full chorus – calls continuous and overlapping, so number of individuals cannot be reliably estimated

Surveys will be completed between one-half hour after sunset and midnight once in each of April, May, and June, in each year of monitoring.

Reptiles

Turtle basking surveys will be conducted over a period of five years post-construction. Surveys should commence as soon as weather conditions permit (i.e., early April), and continue until mid-May (before turtles typically relocate away from overwintering ponds). Five rounds of surveys will be completed each year.

Binoculars will be used to scan shallow water habitat and watercourse channels for potential basking sites (i.e., floating logs or hummocks) for basking turtles. Surfaces of ponds will also be searched for the presence of turtles. This was especially important, since Snapping Turtles tend to bask at the water's surface, not always crawling out of the water.

Surveyors will record all species observed, along with the number of individuals of each species and behaviour.

3.4 ADAPTIVE MANAGEMENT

3.4.1 Riparian Vegetation

The landscape architect will provide input to the yearly post-construction monitoring report. Input will include details regarding monitoring methods, successes and deficiencies of revegetation (Drawings L-300, L-310, L-500, and L-501, Appendix B), recommendations for remedial action, and a photographic record of conditions observed during monitoring. If certain plant species are experiencing high rates of mortality, the landscape architect will be consulted for recommendations on replacing these species with others anticipated to be hardier for the site.

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Ongoing maintenance for the riparian vegetation and wetlands will potentially include supplemental plantings of plugs, shrubs and trees to provide adequate cover and density within the floodplain. Additionally, reseeding of areas that did not survive or are potentially eroded will be conducted.

Maintenance is possible over the three-year monitoring period (i.e., years 1, 2 and 3) for the channel realignments and enhancements. The results of the monitoring program will determine if ongoing inspection and continued floodplain and riparian wetland vegetation maintenance is required.

3.4.2 Wetland Areal Extent Evaluation

Fluctuations in water level within wetlands can assist in discouraging invasive species. While the design of the wetlands considered fluctuating water levels, the intent was not to replicate existing conditions. Existing wetlands are dominated by invasive species and therefore not desired conditions.

In the event that the channel design does not perform as intended, resulting in wetland not achieving predicted aerial extent or water levels fluctuation, remedial actions will be recommended, as discussion in Section 5.4 of the CN Milton Logistic Hub Surface Water Monitoring and Adaptive Management Plan.

3.4.1 Invasive Species Monitoring

In the event follow-up monitoring found invasive species to be a concern, species-specific removal measures will be developed by a qualified biologist. Resources used to develop the measures may include:

- Ontario Invasive Plant Council – www.ontarioinvasiveplants.ca
- Ministry of Natural Resources and Forestry – www.ontario.ca/invasivespecies
- Ontario's Invading Species Awareness Program - <http://www.invadingspecies.com/invaders/>
- Invasive Reed Canary Grass Best Management Practices in Ontario (Ontario Invasive Plant Council 2012)
- Invasive Phragmites – Best Management Practices (MNR 2011)

Other resources or best management plans may also be relied on, depending on the invasive species identified during follow-up monitoring. Remedial measures implemented on site will depend on the species, size of the area affected and the site-specific conditions.

For reed canary grass, measures would follow the *Invasive Reed Canary Grass Best Management Practices in Ontario* (Ontario Invasive Plant Council, 2012). For smaller areas of reed canary grass encroachment, mechanical (e.g., hand pulling) or chemical control (e.g., herbicide) may be used. Other options that could be considered for larger encroachments include tarping or cultural treatments, such as nutrient reduction.

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If adaptive management measures are required, an additional two years of follow-up invasive species monitoring will be conducted to evaluate the effectiveness of the measures.

3.5 REPORTING

The results of the wetland monitoring activities proposed as part of the follow-up program will be reviewed, analyzed and presented in a report to document (a) the results of the monitoring program (b) recommendations for remedial action (and review of previous remedial action), and (c) to include a photographic record of conditions observed during monitoring.

A report will be prepared annually with the results provided to ECCC, Conservation Halton and other relevant authorities as applicable and will be included as a component of the annual report to IAAC.