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May 18, 2018

Lesley Griffiths  
Panel Chair  
c/o Canadian Environmental Assessment Agency  
160 Elgin Street  
Ottawa ON, K1A 0H3

By email  
Dear Ms. Griffiths:

The Canadian National Railway Company (CN) is pleased to provide our response to a portion IR 5 from the *Information Request Packages 4.2 and 5 – Milton Logistics Hub Project Review Panel* (Doc # 602) received on Oct 31, 2017 as supplemental information for your review and consideration in support of the Environmental Impact Statement (EIS) under the Canadian Environmental Assessment Act, 2012 (CEAA 2012).

We trust this additional information will sufficiently clarify the questions posed by the Review Panel in the review of our proposed Milton Logistics Hub project.

Should you have any questions regarding the above, please do not hesitate to contact me.

Sincerely,

<Original signed by>

Luanne Patterson  
Senior System Manager – Environmental Assessment

cc: Dr. Isobel Heathcote, Review Panel Member  
Mr. William McMurray, Review Panel Member  
Joseph Ronzio, CEAA  
Darren Reynolds, CN

**CN Milton Logistics Hub (“Project”)  
CEAR File No. 80100**

**CN Response to the Review Panel’s Information Request 5  
Received October 31, 2017**

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The following information is provided in partial response to Information Request 5 to address IR5.2 to IR5.18, received from the Review Panel on October 31, 2017. Information pertaining to IR5.1 and 5.19 to 5.24 will be provided under separate cover at a later date.

## **CUMULATIVE EFFECTS ASSESSMENT**

### **IR5.2 Effects of past projects and activities**

**Rationale:** CN conducted a cumulative effects assessment on fish and fish habitat, migratory birds, species at risk and socio-economic conditions because it had determined that the Project was likely to result in residual environmental effects on these valued components. In response to the CEEA's Additional Information Requirements #13 and #25 (CEAR #72 and CEAR #375), CN provided a cumulative effects assessment for air quality and provided additional information on the cumulative effects from the Project in combination with the past, present and reasonably foreseeable physical activities in the regional assessment area.

CN stated that, in its cumulative effects assessment, it had considered that current conditions were reflective of past effects to valued components. As such, it appears as though CN did not include effects of past projects and activities in the overall conclusions on the significance of cumulative effects. For instance, in response to the CEEA's Additional Information Requirement #25 (CEAR #375), for fish and fish habitat, CN stated generally that past and present projects and activities in the regional assessment area had acted cumulatively on fish mortality and that these effects have determined the current conditions. CN described the effects of the Project and the effects of three future physical activities on fish mortality. CN concluded that the cumulative effects on fish mortality would not be significant given that the current productivity and sustainability of the commercial, recreational or Aboriginal fishery would not be further reduced. It remains unclear how the effects of past and ongoing projects were considered in this determination. This same approach was followed for all of the valued components considered in the cumulative effects assessment.

The Canadian Environmental Assessment Act, 2012 requires that any cumulative environmental effects that are likely to result from the designated project, in combination with other physical activities that have been or will be carried out, be taken into account in the environmental assessment. To fulfill this requirement, an assessment would need to provide a clear understanding of both the estimated cumulative effects on valued components from past, present and future projects and activities, and the contribution of the project to the cumulative effects. Solely acknowledging that a valued component has been previously affected by past developments and considering the current conditions as a baseline in an area that has experienced a number of previous developments may not provide a reasonable understanding of the cumulative effects from successive past and present projects. If each successive project in an area incorporated past effects into the baseline, the baseline would continually shift and significant effects to valued components could be overlooked.

**Information Request:**

a) Provide a cumulative effects assessment that clearly describes:

- how the valued components have been affected by past and ongoing activities;
- how the Project's and other future projects' residual effects would further affect the condition of the valued components; and
- the overall cumulative effects to each valued component from the selected past condition to predicted future conditions.

Ensure that responses to all other information requests asking for a cumulative effects assessment reflect this directive.

**CN Response:**

This response is organized as follows:

- **Response History and Rationale:** summarizes history of relevant sections of the EIS, associated IRs and basis of response to **IR5.2**
- **Cumulative Effects Assessment:** Description of Past Conditions
- **Historical Baseline:** provides a qualitative description of the Historical Baseline chosen to represent conditions in the far past prior to European Settlement
- **European Settlement:** provides a qualitative description of the transition between the Historical Baseline and the Selected Past Baseline
- **Selected Past Baseline:** provides a qualitative description of the Selected Past Baseline chosen to represent an appropriate past condition for the purpose of assessment in this IR response
- **Cumulative Effects Assessment:** Selected Past Baseline to Future: provides an assessment of potential cumulative effects for each valued component (VC), based on the cumulative effects assessment (CEA) already completed and description of past conditions, from the Selected Past Baseline to the Reasonably Foreseeable Future
- **Summary and Conclusion**

**Table IR5.2-1** summarizes the timeline associated with the above. Details are provided in the response.



**Table IR5.2-1 Summary of Temporal Scenarios**

Assessment Temporal Scenario	Approximate Years	Scenario Condition	Dominant Landscape Character	Past Reference Point in Time for CEA <sup>1</sup>	
				EIS	IR5.2
Historical Baseline	early 1800s	pre-colonization	post-glacial Carolinian forest		
European Settlement	late 1800s to early 1900s	colonization	agricultural conversion		
Selected Past Baseline	1950s	post-WWII	urban development		Reference
Present	2010s	current		Reference	
Future	2020s	certain and reasonably foreseeable			

1 - VC state at reference point (green shade with thick border) reflects anthropogenic effects since Historical Baseline (blue shade)

## Response History and Rationale

### EIS and IR History

A CEA was completed as part of the EIS (EIS Section 6.6.1). The CEA was completed based on the approach described in the Canadian Environmental Assessment Agency's (CEAA) Operational Policy Statement *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* and the *Cumulative Effects Assessment Practitioners' Guide, 1999* (and more recently updated Interim Technical Guidance entitled "Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012" released in March 2018). The assessment of cumulative environmental effects was carried out with respect to any Project-related residual environmental effect on a VC that was considered likely to interact cumulatively with the residual environmental effect of another past, present or certain and reasonably foreseeable future project or physical activity.

Initial review of the EIS by CEAA resulted in additional information requests for the Project during the completeness review (CEAR #72). During this round of information requests, CEAA requested clarification on the temporal boundaries and the comprehensive list of all the projects and activities – past, present, and certain and reasonably foreseeable – that were considered in the CEA as provided in Table 6.2 of the EIS (Section 6.2.10, pages 125 to 128). In response to this request, CN provided an expanded, comprehensive list of all Projects and activities for all environmental effects of past, present, certain, and reasonably foreseeable future projects and activities, the effects of which were likely to interact cumulatively with Project residual effects, as well as the rationale for inclusion and exclusion of each project (and each corresponding project phase) in the CEA (see Attachment IR25 – Supplemental Project Information for Cumulative Environmental Effects, CEAR #72).

After receiving CN's written responses to CEAR #72, another set of information requests were sent as part of the completeness review by the CEAA (CEAR #375). During this round of information requests, the CEAA sought further clarification for each VC identified in the EIS and EIS Guidelines for which there is a predicted residual effect of the Project to provide an assessment of the potential Total Cumulative Effects (*i.e.*, of the Project in combination with the effects of past, present, certain, and reasonably foreseeable projects and activities) identified in the EIS and in the response to Additional Information Requirement 25 (CEAR #72). Further to the CEA provided in EIS Section 6.6.1 (pages 264 to 289), CN provided supplemental discussion of the cumulative

effects of the Project in combination with the effects of past, present, and certain and reasonably foreseeable physical activities for each of the VCs identified in the EIS, as well as additional consideration for air quality, surface water, groundwater, and terrestrial landscape (response to IR25, CEAR #[375](#)).

### **CEAA Guidance**

Canadian Environmental Assessment Agency guidance in the form of a final operational policy statement (OPS) constitutes the principal formal federal guidance. The federal guideline: "Operational Policy Statement: Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012" (December 2014 at the time of EIS filing, now dated March 2015), and the guidance within under "*Examining Physical Activities That Have Been Carried Out*" states "Present-day environmental conditions reflect the cumulative environmental effects of many past and existing physical activities." (p. 4). This is the guidance that CN applied to the CEAs in the EIS.

CN is also aware of additional federal guidance, the "Technical Guidance Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012" updated in March 2018 as an Interim Technical Guidance document, Version 2. Regarding setting the past temporal boundary with a VC-centered approach, this guidance states that "the description of the past can take various forms, such as a narrative of the evolution of the VC from the past point in time to the present, a pre-industrial case, or a series of "past temporal snapshots" showing the evolution of the VC" (p. 21). The introduction of the concept of "shifting baseline" reflects the intent for a "historical baseline" or pre-industrial baseline as an initial temporal reference point.

### **Utility of a Historical Baseline**

The use of present day environmental conditions to characterize both past and present effects of projects and activities is well established in assessment practice in Canada. The reasons for this are:

1. Present day environmental (baseline) conditions reflect the outcome of past projects and activities through whatever changes (effects) those projects and activities had (whether they remain visible on the landscape or not). What is important in any assessment is the current state of the VC (influenced by the past) and what the condition of the VC will be if development of the Project and other certain and reasonably foreseeable projects and activities occurs. As such, a historical baseline is not needed.
2. The uncertainty of what constitutes past conditions increases the further back in time one goes, even in consideration of traditional knowledge. Creating a historical baseline for the Project would require detailed historical knowledge over multiple centuries. The resulting uncertainty would make the results meaningless for an environmental assessment.

A "Historical Baseline" would often be unreliable as adequate descriptive data of its state is typically not readily available. In the absence of such data, various assumptions would be required to emulate "pre-disturbance" conditions. The longer the period of time between current conditions and the "Historical Baseline", the greater the level of uncertainty.

CN is aware, for some earlier projects subject to federal review, for example in Alberta's Athabasca oil sands region, of the use of a "pre-disturbance" scenario (e.g., Total Joslyn North Mine Project). In those situations, the scenario was not defined through assessing *known* past



conditions, but by *assuming* conditions through removal of all existing anthropogenic disturbance and infilling with the current surrounding natural land cover. That approach would be far less useful as the regional landscape in the RAA has experienced extensive anthropogenic disturbance, making prior conditions no longer adequately available or known for characterization in support of an assessment.

As such, the “true” nature of far past conditions before such extensive modification is largely unknown. The oil sands landscape was the reverse; namely, the projects were proposed in what is still largely a natural setting (boreal forest), making easier the simulated return of proposed project lands to that same forest setting which can be described with an acceptable degree of certainty.

The equivalent transformation in this region of Ontario, resulting from anthropogenic disturbance and change in land use began since at least the creation of Upper Canada (circa. 1800) and has continued for more than 200 years to present day. The result has been a substantial replacement of the original forest landscape with remnant patches managed through many plans at various levels of government, including protected natural areas of old-growth forests, lakes, wetlands, rivers, archaeological sites or cultural value sites, and habitat for rare or endangered plants and wildlife. A substantial portion of the landscape is now commercial agricultural land within the Halton Region, including the land on which the proposed Project would be located, notwithstanding acknowledgement that this land has already been planned for conversion to urban land uses through the designation of Employment lands through to 2031 (Halton Region Official Plan).

CN maintains that it is reasonable for a CEA that the present day, comprising existing environmental conditions (baseline), not the original Carolinian forest, constitutes the appropriate earliest temporal boundary for the CEA for this project and appropriately addresses the successive past activities that have affected the present-day conditions. As was explained above, this may be different in regions in which the original (prior to extensive development) landscape largely remains, such as for oil sands projects in northern Alberta's boreal forest. In Southern Ontario, the biophysical setting of relevance is what has now been established as a new mix of many land use types. To revert to the original pre-colonization landscape as baseline would only reduce the relative contribution of CN's proposed Project on a cumulative effects basis to near immeasurable levels (compared to the extensive conversion of the landscape over the last 200 years) and increase the assumptions required (therefore increasing the level of uncertainty in the predictions).

### **Consideration of Past Temporal Scenarios**

Notwithstanding the above, in keeping with the spirit of the intent of taking past temporal boundaries into account, and in consideration of the additional statement from the OPS “A description of past environmental conditions can at times improve the understanding of cumulative environmental effects for a specific VC.” (p. 4), the following provides a qualitative discussion of conditions along a series of temporal scenarios. All have a high degree of uncertainty at a coarse landscape level and less information than typical for an assessment, the more so the farther back in time. The low degree of spatial resolution further back in time of environmental setting details therefore limits such assessments to generalized observations and conclusions.

The first scenario, prior to European colonization, is referred to as the Historical Baseline. The second, referred to here as European Settlement, describes conditions between the Historical Baseline and the Selected Past Baseline. The third, referred to here as the Selected Past Baseline, represents the past condition subsequently considered for this assessment (see **Table IR5.2-1** for a summary of these and the other temporal scenarios).



While CN recognizes the various changes from the Historical Baseline described above, the Selected Past Baseline is viewed as most reasonable for the purposes of this assessment, representing an appropriate starting point from which a meaningful discussion of past contributions to cumulative effects in the Regional Assessment Area (RAA) can be made. This point in time has been set at post World War II in the 1950s, chosen to represent a key transitional period in the region in which the dominant anthropogenic disturbance noticeably changed from agriculture to urban development. As such, conditions since that point in time are both more reflective of current drivers of anthropogenic change and carry a relatively greater degree of understanding and certainty.

The first part of this CEA is therefore the description of the three past temporal scenarios (Historical Baseline, European Settlement, Selected Past Baseline). The second part of this CEA is the assessment of potential cumulative effects to VCs in the time period from Selected Past Baseline to the certain and reasonably foreseeable Future.

## **Cumulative Effects Assessment: Description of Past Conditions**

### ***Historical Baseline Description***

The time period for this temporal scenario is the early 1800s.

Aquatic habitat in the Bronte Creek watershed, including Indian Creek and its tributaries, may have provided fish habitat to several native aquatic species, running through several forested areas, with mostly cold or cool water with less diversification in species as a result (Kilgour and Stanfield 2006).

Terrestrial habitat was likely dominated by the original extensive coverage of the Carolinian forest within the Mixedwood Plain ecozone of what is now known as Southern Ontario. Potential habitat for migratory birds was likely dominated by hardwood species such as beech, basswood, oak, walnut, and maple, with occasional elm and pine and scattered balsam fir (Jameson 1838 and Strickland 1853). With a greater forested area, this would provide for more woodland habitat rather than grassland or wetland. Woodland in the RAA would have provided different habitat and would support different species than what currently exists at the Project site.

Pre-contact Aboriginal occupation of southwestern Ontario has been demonstrated as far back as 11,000 years as the glaciers retreated (EIS, Appendix E.14, pp12). For the majority of this time, people practiced hunter gatherer lifestyles with a gradual move towards more extensive farming practices. A cultural chronology in the Regional Municipality of Halton, based on Ellis and Ferris (1990) is provided in Table 4 of the EIS, Appendix E.14, pp12.

A description of the post-contact Aboriginal occupation of Southern Ontario, including the Project Development Area (PDA), is provided in the EIS, Appendix E.14, pp 6-7. This provides a description of the various Aboriginal groups that migrated into the region, the settling of the Mississaugas of the New Credit First Nation (MNCFN) into the area and the negotiation of Treaty 13A, which included the land on which the Project lies today.

### **European Settlement Description**

The following provides a *qualitative* description of the natural and human history of the region, between the early 1800s and the early 1900s.

Extensive clearing of hardwood forests began with the arrival of European settlers in southern Ontario. Hardwood was the main source of heat for homes and cooking; in addition, this period saw the start of the lumber trade in the region. This historic land use has been described in the EIS, Appendix E.3, pp15-17, from early settlement in 1805 of the Trafalgar Township, along the banks of Lake Ontario, to the 20th century, a mixture of residential development around the Town of Milton and rural agricultural dominated land use. In 1821, the first settlers of the Milton area arrived, Sarah and Jasper Martin and their two young sons from Northumberland (Milton Historical Society). In 1836, the first doctor, school, store, and post office were opened on what would become Main Street, Milton. In 1857, the town of Milton was incorporated, with a population of approximately 300. The town had a large sawmill that serviced the town and surrounding area and by the 1870s the population had grown to 1,200.

Milton became the centre of trade and transportation for the small hamlet of North Trafalgar (Walker and Miles 1877). The railway to Milton from Hamilton was built in 1878 by Hamilton and Northwestern Railway Company, later to eventually be amalgamated into CN in 1923 (EIS, Appendix E.14, pp18; Cooper 1982). By 1881, 73% of the land was cleared with all but 11% assigned to agricultural use within the County of Halton (Ontario Agricultural Commission 1881 – EIS, Section 6.3.11, p.158). Based on the Ontario Agricultural Commission (1881), the following selected descriptions and state of the environment were recorded:

- Halton County acreage was 223,000, of which about 164,075 was cleared
- For agricultural purposes, 52% of the entire cleared area was reported as first class, 25% second class and remainder as third class
- 17% of the entire area was still timbered, mainly hardwood with limited pine
- About 85% of the land was stump free, remaining stumps were nearly all pine
- 74% of all dwellings are of brick, stone, or first-class frame; remainder are log or inferior frame
- Drainage alteration was to a limited extent only
- Fertilizers on spring wheat and clover had been used (not excessively) including salt, plaster, and superphosphates
- 32% of uncleared land was suitable for cultivation
- Local industries included woolen and paper mills, hydraulic, cement and mineral paint works
- Population of the County was 22,606 (1871 census)

As the removal of trees for both trade/sale and local use for building and heating proceeded, land clearing made way for agriculture, mainly through growth of grains. Settlement of the Bronte Creek watershed, including the change in land cover from forest to agricultural land use, changed flows and altered temperature regimes in the creeks (Conservation Halton (CH), 2002). Dams blocked fish movement and pollution from settlement and industry degraded water quality. Such changes resulted in the loss of species such as elk, bison and marten from the watershed (CH 2002). Marketed commodities included wheat, pork, potash, lumber, butter and lard during the late 1800s (CH 2002). Species such as bear and passenger pigeon were by then extinct from the region, while Europeans introduced European hare and starling to the area. Sturgeon and Atlantic salmon were absent, but carp and alewife thrived (CH 2002).



In 1908, Peter Lymburner Robertson opened a factory in Milton to produce socket headed screws. This factory became one of the main employment source for many citizens. By 1950, there were over 600 employees working at the factory (Lamb 1998) over multiple decades throughout the area.

### **Selected Past Baseline Description**

The time period for this temporal scenario is the 1950s.

Residential growth in the Milton area surged after the expansion of the King's Highway 401 (Town of Milton Historical Society) in 1957. Proximity to a major highway led to more regional development. The shift in dominant land use from largely agricultural base to the beginning of urban developed with the surge in population growth and the necessity to apply planning in an organized manner to control the urban expansion while balancing the need to start protecting the environment. Based on evaluation of historical aerial photography, the Town of Milton was approximately 145 ha in development extent in 1954, surrounded by rural, agricultural fields and fragmented woodlots, and windrows (see **Attachment IR5.2-1: Historic Map of the Town of Milton, circa 1954**). Highway 401 was built in phases based on those sections where congestion on neighbouring highways were a problem, which included the Milton to Toronto section in 1957 (<http://www.thekingshighway.ca/Highway401.htm>, accessed 2018). Socio-economic conditions of the day were prosperous given successful agriculture, urban and population growth with increased employment opportunities and the stimulus that was developing post war.

As described in the EIS, Appendix E.14, the Project site is located within the Indian Creek sub-watershed of Bronte Creek. The headwaters of much of this sub-watershed drain from the Niagara Escarpment and descend the slopes to the Peel Plain south of Derry Road (CH 2002). In the years following WWI, the commercial fishery for Bronte Creek declined, including for perch and whitefish, cisco and herring (CH 2002). After WWII, rapid population growth in the watershed led to urban development and decline of many fruit farms and orchards below the Escarpment (CH 2002). Establishment of quarries to extract high quality dolostone from the Niagara Escarpment became another source of pollution in the watershed. Continued agricultural practices in the area during this period continued to contribute sediments and degradation to the local streams, creeks and tributaries. Alteration of tributaries, creeks, and streams began to accommodate urban development and agricultural needs (irrigation and continuous crops).

Rapid agricultural development drove the need for conservation in the area. In 1956, the Sixteen Mile Creek Conservation Authority was formed and, in 1958, the Twelve Mile Creek Conservation Authority was formed, later (1963) to form the Halton Region Conservation Authority (Conservation Halton website, accessed 2018). The first conservation area for the region was established in 1958 (the Esquesing Conservation Area) in the Halton region. This was in response to a request to the Minister of Planning and Development to conduct a conservation survey of the watershed and to obtain a professional opinion of the problems and solutions for the Sixteen Mile Creek Watershed. In 1959, the Mount Nemo Conservation Area was developed to prevent expansion of a quarry operation through an initial acquisition of 88 acres (with further acquisitions throughout the mid to late 20<sup>th</sup> century) by the Twelve Mile Creek Conservation Authority. In 1960, the Sixteen Mile Creek Conservation Authority acquired river valley lands west of Milton for water management purposes, which later became the Kelso Conservation Area. Further areas of conservation were ultimately developed by both Conservation Authorities in response to the recognition of the natural environment and value that environment had within the ecosystem, and in support of natural resource management and environmental protection required to keep these areas intact within the landscape.



While fragmentation of woodlands began during the European settlement of the area, development during the 1950s was largely within the existing towns and urban settlements. Less homesteads and buildings dotted the landscape throughout the Halton region than present day, and agricultural fields were more continuous. While agriculture was the main way of life for the region, a recognition of the critical situation of the deforestation of the past (e.g., annual flows of extensive river sheds draining the now open land, wind and water erosion of soil) had farmers taking serious action to reverse the damage already done (Bowley 2015). By the 1950s, sustainable agriculture began to gain currency, through the movement founded by the formation of the Land Fellowship, with emphasis on retaining a dynamic soil ecosystem (MacRae 2014). Agricultural fields, grassland, and wetlands within the rural setting of the Halton region (surrounding the Town of Milton) likely provided suitable habitat for the same species identified in the EIS (EIS, Section 6.3.6 p. 144). Data sets of specific migratory birds or the specific species at risk identified that may occur in similar habitat today are not available from the 1950s; however, it is more certainly known that specific species have become threatened or at risk that exist in the area (EIS, Section 6.3.6 and 6.3.7). As to when these populations were once stable for the area is, however, unknown.

Ecology and the concept of an ecosystem were largely still a scholarly discussion and had not become a direction for planning on the landscape. Also, the formal identification of species at risk remained decades into the future (the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) was not created until 1977 to address the need for a process to identify wildlife species that are at risk across Canada). Understanding of the direct impacts of changes in the landscape through deforestation were finally being realized; however, reforestation was limited to roadsides to reduce effects to roads and traffic.

By the 1950s, much of the land within the vicinity of the Project had been privately purchased by local farmers from the government. Land treaties between the Aboriginal groups within the area and the governing bodies of the day began in the 1800s. While the area within the Bronte Creek Watershed was used by the MNCFN for traditional use such as hunting, trapping, plant harvesting, fishing, and cultural and spiritual practices (EIS Section 6.3.8), it is unknown if this area was a locally used site for such practices by mid-20<sup>th</sup> century.

Milton has grown since the 1950s from a small rural town with rail access supporting its growth to a satellite of the Greater Toronto and Hamilton Area (GTHA). Increased industrial and commercial operations supported this local growth (e.g., Crawford Metals, All Mix, Roxul/Rockwool, Maplehurst Correctional Complex) with increased opportunities for logistics support and distribution centres (e.g., Iway Transport Inc, Wheel King Transhaul, Dare Foods, Lowe's Distribution, Whirlpool, Gordon Food). Transportation planning in the RAA recognized the need to improve goods movement within the GTHA and with adjacent regions (EIS Appendix E.12, Section 5.3.5.7).

Rather than identify individual past projects within this timeframe, it is important to recognize the marked urban expansion within the RAA, from an agricultural based rural setting to an urbanized setting, with land use development characterized by urban setting since the 1950s (*i.e.*, increased infrastructure to support industrial, commercial, institutional and residential growth). Population of Milton in 1951 was 2,451 and by 1956 was 4,294 (Statistics Canada historical data).

### **Cumulative Effects Assessment: Selected Past Baseline to Future**

The following provides an assessment of potential cumulative effects using the Selected Past Baseline as the past reference point in time. This is done for the same four VCs that were assessed for cumulative effects in the EIS (*i.e.*, fish and fish habitat, migratory birds, Species at Risk, socio-



economic conditions) as these VCs were evaluated as having adverse residual effects that could potentially contribute to cumulative effects in combination with other projects and activities that have been or will be carried out.

Each VC assessment is organized as follows:

- Selected Past Baseline to Present Conditions (*i.e.*, how the VC was affected by Past Projects and Activities)
- Changes as a result of the Project (*i.e.*, how the VC will be affected by the Project)
- Future Conditions (*i.e.*, how the VC will be further affected by other certain and reasonably foreseeable projects and activities)
- Assessment of Cumulative Effects (*i.e.*, an assessment of cumulative effects in consideration of the above)

### **Fish and Fish Habitat**

#### *Selected Past Baseline to Present Conditions*

Selected Past Baseline conditions of Indian Creek and tributaries were that of a warm water system that is assumed, based on the similarities in landscape conditions, to have supported a diverse fish community similar to present day conditions. Open agricultural fields and limited riparian vegetation cover to the edges of the creek and tributaries would have provided limited cover for the creek and tributaries, contributing to the warm water conditions. Based on the historical aerial photography, Tributary A was not as well defined in the 1950s as it is today north of the existing CN rail line, likely a result of agricultural practices and potentially due to the construction of the landfill now located in the area (see **Attachment IR5.2-1**). The change through the years from the Selected Past Baseline condition to present day would have likely contributed to some fish mortality as development increased within the area directly adjacent to Indian Creek and its tributaries.

Today, Indian Creek remains a warm water system that still supports a diverse fish community (Conservation Halton 2002, and 2009; AMEC 2013a 2013b), but water quality is considered moderately to substantially impaired (CH 2002), primarily because of riparian land-use, straightening of tributaries, low density of riparian vegetation, and the presence of on-line agricultural ponds. The characteristic fine textured soils and extensive vegetation clearing over the Peel Plain generally limits the groundwater recharge. Vegetation cover within the sub-watershed is sparse and agricultural fields extend to the stream banks over most of the watershed (CH 2002).

#### *Changes as a Result of the Project*

The environmental effects assessment completed for the Project on fish and fish habitat is provided in the EIS, Section 6.5.1. As stated in response to IR 25 (CEAR #375), CN's proposed naturalization of Indian Creek and portions of Tributary A (including removal of the on-line pond, as recommended by Conservation Halton in the 2002 Bronte Creek Watershed Study) would have a positive effect on the quality of the water in Indian Creek and tributaries and would therefore contribute to the protection of fish. Details are further described in response to IR4.49 and IR3.19 about the conceptual fish and fish habitat offsetting plan, including improved fish movement/passage in Tributary A and how increased riparian habitat will contribute to water quality and thermal regime improvements resulting in improved fish habitat. Based on this assessment, residual effects that were adverse in direction were limited to the change in fish mortality during construction. This residual effect was



characterized to be low in magnitude, extend into the Local Assessment Area (LAA), short-term in duration, an irregular event and irreversible.

#### *Future Conditions*

The certain or reasonably foreseeable future physical activities (Boyne Planning District, Britannia Road Transportation Corridor Improvements, Union Gas Hamilton-Milton Project, and the Milton Education Village (MEV)) identified in the assessment (and clarified in response to IR25, CEAR #72 and response to **IR5.3**) may contribute cumulatively to fish mortality. However, the expected implementation of mitigation measures, best management practices and working outside of the restricted activity period (RAP), as presented in the EIS (Section 6.5.1.9.4, page 193 to 184, and Chapter 7, Table 7.1, page 311 to 320), is expected to reduce the potential interaction between fish and construction equipment or from deleterious materials entering the watercourses from these projects. Any increase in fish mortality is expected to be limited and short-term in duration (*i.e.*, during construction phase only).

#### *Assessment of Cumulative Effects*

As stated, the past and present projects and activities in the RAA listed in Table 6.43 (EIS Section 6.6.1.1.1, page 265 and IR25 CEAR #375) have acted cumulatively on fish mortality. Development of the Town of Milton from the 1950s to present day conditions, as well as industrial development and agricultural conversion, has resulted in the realignment and channelization of watercourses, increased sedimentation in Indian Creek and its tributaries and affected water and sediment quality of the streams. These effects, which continue in the present, have determined the current conditions for fish and fish habitat within the RAA.

The contribution of the Project to the present day condition has the potential to act cumulatively on fish mortality. Potential fish mortality risk during the construction phase may be increased during in-water works or through the introduction of a deleterious substance (*i.e.*, sediment). Mitigation measures will be implemented (as described in the EIS, Section 6.5.1.9), and best management practices and working outside of restricted activities periods will further reduce the Project contribution to cumulative effects of fish mortality as limited events.

Future physical activities, as defined in the response to IR25 (CEAR #375) and in the EIS (Section 6.6.1.1.1, Table 6.43, page 265) within the RAA would be expected to follow the guidance provided in the Bronte Creek Watershed Study (2002), Boyne Survey Secondary Plan (Town of Milton 2015) and associated compensation plans (AMEC 2013), and therefore are not expected to increase mortality risk of fish or degradation of fish habitat, resulting in mortality of fish.

The proposed improvements to the habitat of Indian Creek would have a positive effect on the quality of the water in Indian Creek and tributaries and would therefore contribute to the protection of fish.

#### ***Migratory Birds and Species at Risk***

Based on fundamental similar life-history dependence of migratory birds and Species at Risk (SAR) on available habitat, and the need to generalize such habitat for past conditions given lack of specific details, the discussion below has been combined for both of these VCs.



### *Selected Past Baseline to Present Day Conditions*

While data are not available for specific migratory birds or SAR for the Selected Past Baseline conditions, similar habitat likely existed as it does today. A review of the aerial photography of the RAA (see **Attachment IR5.2-1**) allows a direct comparison of the habitat as it existed at that time. Agricultural fields dominate the landscape with similar woodlands and wetlands that exist today, with some such areas since replaced by urban development. Based on the similarities in habitat categories of the selected past baseline conditions to present day, wildlife species that exist and breed in these habitats today likely also did so in the past.

### *Changes as a Result of the Project*

An environmental effects assessment was separately completed for the Project on both migratory birds and SAR (see the EIS, Section 6.5.2 and 6.5.3 respectively).

Habitat within the LAA for migratory birds and SAR consists of the following three categories, which are common of agricultural settings:

- Woodlands (Oak-Maple dominated forest at southern extent of LAA)
- Grassland (hay, pasture, cultural meadows and some early successional/shrubland areas)
- Wetlands (meadow marsh habitat)

Woodlands are not present in the PDA; however, they are scattered as woodlots in agricultural fields throughout the LAA and RAA. The most prominent habitat within these areas are grassland habitat that occurs as hay and meadow fields. Some large provincially significant wetlands (PSWs) occur within the RAA. Within the LAA, wetland habitat is limited, but includes two small marsh communities. Few species were recorded in the wetland migratory bird habitats point counts.

A total of 64 species of birds were observed in the LAA, 57 of which are likely to be breeding and seven species that have the potential to forage within the LAA. No rare birds or specialized habitat (such as breeding colonies) were found to be present within the LAA. A description of all bird types and species of special concern found within the LAA habitat is found in the EIS, Section 6.5.2.7.

A total of seven SAR and/or their habitats were observed in the LAA, some of which also occur within the PDA. SAR and their habitats are described in the EIS, Section 6.5.3.7.

Residual effects were assessed for migratory birds and SAR that were adverse in direction included changes in direct mortality to migratory birds and SAR, changes in migratory bird use of the area, changes in habitat for SAR and sensory disturbance for migratory birds. No critical habitat for SAR species were identified in the PDA. Summaries of residual effects characterization were provided in the EIS, Table 6.22 and 6.26.

### *Future Conditions*

The certain or reasonably foreseeable future physical activities as identified in the assessment (and clarified in the response to IR 25, CEAR #72), include the Boyne Planning District (potentially affecting both migratory birds and SAR), the Britannia Road Transportation Corridor Improvements (potentially affecting migratory birds only), Urban and Rural Road upgrades (potentially affecting migratory birds only), the Union Gas Hamilton-Milton Project (potentially affecting both migratory



birds and SAR) . The MEV is proposed within agricultural fields that are in annual row crops (*i.e.*, not hay or pasture), and are therefore not anticipated to interact cumulatively with the effects from the Project (see response to **IR5.3**, **IR5.7**, and **IR5.8**).

These may have the ability to contribute cumulatively to environmental effects on migratory bird and SAR as described in the CEA of the EIS (Section 6.6.1.2 and 6.6.1.3). However, the expected implementation of mitigation measures and best management practices by those proponents, as presented in the EIS (Sections 6.5.2.9.4, 6.5.3.9.4, Chapter 7, Table 7.1, page 311 to 320, response to **IR5.7** and **IR5.8**), is expected to reduce potential effects on migratory birds and SAR. A summary of the cumulative environmental effects on migratory birds is provided in Table 6.46, EIS Section 6.6.1.2.5 and for SAR in Table 6.48, EIS Section 6.6.1.3.5.

#### *Assessment of Cumulative Effects*

As stated, the past and present projects and activities in the RAA listed in Table 6.45 for migratory birds (EIS Section 6.6.1.2.1, and IR25 CEAR #375) have acted cumulatively, resulting in migratory bird direct mortality, change in migratory bird use of area and sensory disturbance. The past and present projects and activities in the RAA listed in Table 6.47 for SAR (EIS Section 6.6.1.3.1 and CEAR #375) have acted cumulatively, resulting in direct mortality and change in habitat for federal SAR.

Development of the Town of Milton and elsewhere from the rural town conditions of the 1950s to present day conditions, as well as industrial development, has resulted in direct loss of habitat including woodlots, grasslands and wetlands. Relatively minor agricultural conversion has occurred since the Selected Past Baseline conditions to present day conditions within the RAA. These effects, which continue in the present, have determined the current conditions for migratory birds and SAR within the RAA.

Development of the Town of Milton from the Selected Past Baseline conditions to present day conditions, while not quantified, has likely resulted in some direct mortality to migratory birds and SAR, change in migratory bird use of habitat, loss of habitat for federal SAR and sensory disturbance to migratory birds through the years of urban development pressures within the RAA.

Habitat remains available in consideration of regional land use planning and conservation within the Halton Region, which includes nearly 18,500 ha of forests, wetlands, river and stream corridors and large sections of the Lake Ontario Shoreline and Niagara Escarpment. Some of these areas are privately owned and managed, and some are land uses protected by the Halton Region or other government agencies.

While availability of grassland habitat has generally decreased, Bobolink and Eastern Meadowlark (among other non-SAR migratory birds that use this habitat) are not anticipated to be further affected by fragmentation through development of the PDA. Areas with agricultural practices, although outside the RAA, will continue to provide suitable habitat for such species. CN will work with Ducks Unlimited Canada in establishing 40.7 ha of Bobolink and Eastern Meadowlark habitat to offset the loss of similar habitat within the PDA. The creation and maintenance of Bobolink and Eastern Meadowlark habitat is designed to achieve a benefit to the species.

Barn swallow habitat identified within the PDA will be retained through construction and operation of the Terminal, and other areas of similar habitat will continue to be present within the LAA, RAA and Halton Region, as Barn Swallows are a species that commonly nest in proximity to roads, railways (*i.e.*, culverts and bridges) and human presence (e.g., barns, sheds).



Woodland (Western Chorus Frog, Eastern Wood- Peewee and Little Brown Myotis) habitat occurs outside of the PDA and will not be affected by the Project.

Wetland habitat will decrease within the PDA (3.7 ha), including Snapping Turtle habitat; however, the existing and newly created habitat along Indian Creek and Tributary A (11.7 ha) that will remain will provide more habitat after construction and will provide a better opportunity for longer term sustainability for species in those locations.

A loss of 10.8 ha of suitable Monarch habitat in the PDA will be compensated for by the creation of 18.8 ha of better quality habitat (higher concentration of food plants) in the LAA, as well as consideration for Monarch in the creation of 40.7 ha of offsite grassland habitat.

### **Socio-Economic Conditions**

#### *Selected Past Baseline to Present Conditions*

The Project is located in the Town of Milton in Halton Region, which is part of the GTHA and Greater Golden Horseshoe (GGH). The GGH is the largest urban area in Canada. The socio-economic RAA is the extent of the Halton Region boundary that exists today, as it did in the Selected Past Baseline condition.

The Town of Milton had approximately 145 ha of development extent in 1954, surrounded by rural, agricultural fields and fragmented woodlots, and windrows (see **Attachment IR5.2-1**). Highway 401 was built in phases based on those sections where congestion on neighbouring highways were a problem, which included the Milton to Toronto section in 1957 (<http://www.thekingshighway.ca/Highway401.htm>, accessed 2018). Socio-economic conditions of the day were prosperous given successful agriculture, urban and population growth with increased employment opportunities and the stimulus that was developing post war.

After installation in 2000 of a new water pipeline that was needed to support further development in the Town, Milton set out on a path to become one of Canada's fastest growing municipalities by further attracting a young, educated, and diverse population of residents who were seeking a unique balance of work and life on the west side of the Greater Toronto Area (Town of Milton website, accessed 2018).

With a population for the Town of Milton in 2000 of 32,500 growing to a population of more than 110,000 (Census 2016) and expectations of a population of 228,084 by the year 2031 (Dillon Consulting Ltd. et al. 2011a; Hemson Consulting Ltd. 2013), the change in landscape and environment within the area resulting from this growth will continue.

The Town of Milton is responsible for the construction and maintenance of local municipal roads, local land use planning and other local services. Regional roads are constructed and maintained by Halton Region. Agricultural land use dominates the LAA and RAA. Lands within the PDA consist primarily of active agricultural lands, the majority of which are used in the cultivation of row crops (i.e., soybeans, corn, wheat, etc.) with some of the fields also used to grow hay. CN owns the agricultural lands within the PDA and currently leases them to individual farmers. Halton Region has designated the lands located west of the CN mainline as employment lands and the lands located east of the existing mainline as future strategic employment area. Two existing petroleum pipelines owned by Sun-Canadian cross the PDA, which will be realigned to accommodate the Terminal. Within the PDA, there are no 'Scheduled Waters' as listed under the *Navigation*



*Protection Act* (2014). Navigation in Indian Creek and Tributary A is impeded by the presence of wire agricultural fences. Cycling is a popular activity and may draw cyclists from outside Halton Region. No dedicated bike lanes or paths however occur within the PDA.

#### *Changes as a result of the Project*

The environmental effects assessment completed for the Project on socio-economic conditions is provided in the EIS, Section 6.5.5. Based on this assessment, residual effects for socio-economic conditions that were adverse in direction included a change in the quality and quantity of land and resource use. This residual effect was characterized to be low in magnitude, extend into the LAA, short-term or permanent in duration, continuous and irreversible. The Project will improve existing transportation infrastructure within the RAA and result in efficient and more cost-efficient distribution of goods to retail markets.

#### *Future Conditions*

As provided in the CEA for socio-economic conditions (EIS Section 6.5.1.5) and further described in IR25, CEAR #[375](#), growth in the RAA has been controlled through municipal and regional plans developed or overseen by Halton Region. As part of the Halton Region Official Plan, and in accordance with the Growth Plan for the Greater Golden Horseshoe, 2006 (Ministry of Infrastructure 2013), agricultural land within the RAA has been identified for agricultural conversion to accommodate urban growth (Halton Region 2014). As the need for growth continues, areas designated for expansion that are currently used as agricultural land will be converted (regardless of whether the Project proceeds). The Boyne Survey Secondary Plan Area is anticipated to result in the conversion of 3% of the agricultural land within Halton Region (Town of Milton n.d.).

To provide further regional context, the CN project will result in the loss of 30 ha of planned Prime Agricultural Area (as per the Halton Region Official Plan [Halton Region 2014a], IR4.19) that overlaps the PDA, which represents approximately 0.1 % of the total planned Prime and Agricultural System Outside Prime Agricultural Areas in the RAA. When considered cumulatively, the total area of land affected is still only about 3% of the land available in the RAA (see EIS Section 6.5.5.9, and responses to IR4.19 and **IR5.6**). Further, both the Project and the Boyne Survey Secondary Plan Area are set to occur within areas designated for urban growth and future development by the Town of Milton, Region of Halton and the Province.

#### *Assessment of Cumulative Effects*

As stated, the past and present projects and activities in the RAA listed in Table 6.49 (EIS Section 6.6.1.5.1, page 265 and CEAR #[375](#)) have acted cumulatively, resulting in a change in the quality and quantity of land and resource use. Development of the Town of Milton and Halton Region from existing settlement of the 1950s to present day conditions, as well as industrial development, has contributed to or continues to contribute to a loss of agricultural land, change in recreational resource use through the navigability of watercourses, and a change in the viewscape, while also contributing to the economic activity and land use development for the RAA.

Development of the Town of Milton from the Selected Past Baseline conditions to present day conditions, while not quantified, has resulted in a change in resource use, as development has occurred and the needs of the Town changes through time. The loss of natural vegetation to agriculture and the loss of agricultural resources to urbanization will continue in the future as growth in the RAA continues as it already has, as described in the change from the Selected Past



Baseline to present day conditions. Planned urban growth (residential, commercial and employment areas) in the area will be managed by the Town of Milton and Halton Region in accordance with provincial plans.

A positive cumulative effect in the overall context of socio-economic conditions is predicted as the Project will complement existing transportation infrastructure and improve economic opportunities for the Halton Region, GTHA and Canadian economy. Similar opportunities would be anticipated through development of the Boyne Planning District, MEV, Derry Green Corporate Business Park and future development of the employment designated lands.

### Summary and Conclusion

Historical Baseline conditions (circa early 1800s) and period of subsequent European Settlement (circa late 1800s to early 1900s) have been described to the extent possible. A description of the changes to the environment have been provided as well as a discussion of the uncertainties involved in conducting a CEA with this limited data and captured in a discussion of environmental conditions changing from an area dominated by forest to conversion to agricultural land use.

Conditions post-WWII period (circa 1950s), the Selected Past Baseline, have been described and used as a temporal past scenario for the refinement of the assessment of potential cumulative effects on VCs. Conditions in this scenario are dominated by rapid human population growth and urban development. This period represents the beginning of a substantial change in the nature of anthropogenic effect, from agriculture to urban development (further influenced by regional conservation), similar to the dominant trend today and for the foreseeable future.

For fish and fish habitat, Total Cumulative Effects (*i.e.*, from Selected Past Baseline to Certain and Reasonably Foreseeable Future) reflect the influence of continued urban development and regional planning. The Project contribution to cumulative effects is not anticipated to cause serious harm to fish in consideration of implementation of the proposed habitat offsets and enhancements.

For migratory birds and species at risk, Total Cumulative Effects reflect the influence of continued urban development and regional planning. The Project contribution to cumulative effects is not anticipated to threaten the long-term persistence or viability of migratory birds or SAR species in consideration of implementation of the proposed habitat offsets.

For socio-economic conditions, Total Cumulative Effects reflect the influence of continued urban development and regional planning. The Project contribution to cumulative effects is anticipated to be positive economically and is not anticipated to result in demands for community services or infrastructure that exceed current capacity or not be compatible with adjacent land use activities.

### IR5.3 List of projects considered

**Rationale:** In Table 6.2 of the EIS, CN listed all of the projects and activities – past, present and reasonably foreseeable – that it considered in the cumulative effects assessment. CN also provided additional information about potential effects of these projects in response to the Canadian Environmental Assessment Agency's Additional Information Requirements #25 (CEAR #72). CN did not describe how the list of projects was established and whether and how the Official Plans of Halton Region and the Town of Milton were used to inform the list.



The Canadian Environmental Assessment Agency's technical guidance – Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 (CEAR #571) states that a future physical activity would be considered reasonably foreseeable and should generally be included in the cumulative effects assessment if, among other criteria, it is identified in a development plan. In several submissions to the Review Panel, including CN's response to information request Package 2, participants have also identified the Milton Education Village, which was not included in the list.

**Information Request:**

- a) Explain how the list of projects considered in the cumulative effects assessment was established and how CN used the regional and municipal land use plans to inform the list. Explain why the Milton Education Village was not considered, or revise the cumulative effects assessment to include this project.
- b) If additional certain or reasonably foreseeable projects and activities are identified within the official plans, update the cumulative effects assessment to indicate how the effects of those projects and activities would combine with the residual effects of the Project.

Where applicable, ensure that responses to all other information requests related to the cumulative effects assessment reflect this directive.

**CN Response:**

- a) Explain how the list of projects considered in the cumulative effects assessment was established and how CN used the regional and municipal land use plans to inform the list. Explain why the Milton Education Village was not considered, or revise the cumulative effects assessment to include this project.

The list of projects considered in the CEA in the EIS (Section 6.6.1) was based on interpretation of Section 19(1)(a) of CEAA 2012 and the OPS Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 (CEAA 2015). The specific identification of projects and activities considered to be "certain and reasonably foreseeable" was developed based on a review of available public websites, planning documents and municipal plans, including:

- Burlington Airpark Plan of Development 2010. Available online at: <http://www.burlingtonairpark.com/pdfs/Plan%20of%20Development%20Oct%202010.pdf>
- Conservation Halton. 2002. Bronte Creek Watershed Study.
- Corporation of the Town of Milton. 2008. Report to: Chair & Members of the Community Services Standing Committee on Proposed No Heavy Traffic Regulations. Last accessed July 22, 2015. Available online at: <https://www.milton.ca/MeetingDocuments/Council/agendas2008/rpts2008/ENG-008-08%20Heavy%20Truck%20Prohibitions.pdf>
- Dillon Consulting Limited in Association with GHD Inc. and Aecom. 2011a. The Road to Change; Halton Region Transportation Master Plan 2031. Produced for Halton Region. Accessed July 6, 2015. Available online at: <http://www.halton.ca/common/pages/UserFile.aspx?fileId=68566>



- Dillon Consulting Limited in Association with GHD Inc. and Aecom. 2011b. The Road to Change: Halton Region Transportation Master Plan 2031 – Appendix F4: Goods Movement. Prepared for Halton Region. Last accessed July 22, 2015. Available online at: <http://www.halton.ca/common/pages/UserFile.aspx?fileId=68540>
- Dillon Consulting Limited in Association with GHD Inc. and Aecom. 2011c. The Road to Change: Halton Region Transportation Master Plan 2031 – Appendix F5: Level of Service. Prepared for Halton Region. Last accessed July 6, 2015. Available online at: <http://www.halton.ca/common/pages/UserFile.aspx?fileId=68542>
- Government of Ontario. 2015a. The Niagara Escarpment Plan (2005) Office Consolidation (May 8, 2015). Last accessed July 9, 2015. Available online at: [http://www.escarpment.org/files/file.php?fileId=filejcPrklpvyw&filename=file\\_2015.05.08\\_NEP\\_Office\\_Consolidation\\_May\\_8\\_2015.pdf](http://www.escarpment.org/files/file.php?fileId=filejcPrklpvyw&filename=file_2015.05.08_NEP_Office_Consolidation_May_8_2015.pdf)
- Government of Ontario. 2008. Parkway Belt West Plan 1978 Consolidated to June 2008. Last accessed July 9, 2015. Available online at: <http://www.mah.gov.on.ca/Page5672.aspx>
- Government of Ontario. 2006. Growth Plan for the Greater Golden Horseshoe. Last Accessed August 14, 2015. Available online at: [https://www.placestogrow.ca/index.php?option=com\\_content&task=view&id=9&Itemid=14](https://www.placestogrow.ca/index.php?option=com_content&task=view&id=9&Itemid=14)
- Government of Ontario. 2005. Greenbelt Plan. Last accessed October 9, 2015. Available online at: <http://www.mah.gov.on.ca/Page189.aspx>
- Halton Region. 2015b. Economic Review 2014. Last accessed July 8, 2015. Available online at: <http://www.halton.ca/common/pages/UserFile.aspx?fileId=130497>
- Halton Region. 2013. Halton Region Roads Capital Projects (2014-2031). Available online at: <http://www.halton.ca/cms/One.aspx?portalId=8310&pageId=12113>
- Halton Region. 2014a. Halton Region Official Plan (November 28, 2014) Interim Office Consolidation. Last accessed July 8, 2015. Available online at: <http://www.halton.ca/cms/One.aspx?portalId=8310&pageId=115808>
- Halton Region. 2014b. Transportation Services 2013 Progress Report. Last accessed October 8, 2015. Available online at: <http://sirepub.halton.ca/cache/2/hlws1upc2qluydvdjpevb3cc/17651310082015093244844.PDF>
- Halton Region. n.d. a. Paramedic Services. Last accessed July 9, 2015. Available online at: <http://www.halton.ca/cms/One.aspx?portalId=8310&pageId=12557>
- Halton Region. n.d. b. Regional Road Improvement Program. Last accessed November 20, 2015. Available online at: <http://www.halton.ca/cms/One.aspx?portalId=8310&pageId=109886>
- Halton Region. n.d. c. Halton Region Construction Projects. Last accessed October 9, 2015. Available online at: [http://www.halton.ca/living\\_in\\_halton/construction\\_projects/](http://www.halton.ca/living_in_halton/construction_projects/)
- Halton Region. n.d. d. Wastewater Treatment Plants and Tours. Last accessed July 8, 2015. Available online at: <http://www.halton.ca/cms/one.aspx?portalId=8310&pageId=12343>

- Halton Region. n.d. f. Halton Region Official Plan Fact Sheet. Last accessed July 8, 2015. Available online at: <http://www.halton.ca/cms/One.aspx?pagelid=8580>
- Hemson Consulting Ltd. 2013. Greater Golden Horseshoe Growth Forecasts to 2041: Technical Report (November 2012). Last accessed October 6, 2015 at: <http://www.hemson.com/downloads/HEMSON%20-%20Greater%20Golden%20Horseshoe%20-%20Growth%20Forecasts%20to%202041%20-%20Technical%20Report%20Addendum%20and%20Rev.%20Appendix%20B%20-%20Jun2013.pdf>
- Hemson Consulting Ltd. 2012. Greater Golden Horseshoe Growth Forecasts to 2041. Last accessed July 22, 2015. Available online at: <http://www.hemson.com/downloads/HEMSON%20-%20Greater%20Golden%20Horseshoe%20-%20Growth%20Forecasts%20to%202041%20-%20Technical%20Report%20Addendum%20and%20Rev.%20Appendix%20B%20-%20Jun2013.pdf>
- Stantec Consulting Ltd. 2014. Dawn Parkway System Expansion, Hamilton to Milton Section: Environmental Report. Prepared for Union Gas Limited.
- Town of Milton. 2008. Town of Milton Official Plan (Consolidated August 2008).
- Town of Milton. n.d. a. Boyne Survey Secondary Plan. Last accessed July 8, 2015. Available online at: <https://www.milton.ca/en/townhall/boynesurvey.asp>
- Town of Milton. n.d. c. Roads and Infrastructure. Last accessed July 6, 2015. Available online at: <https://www.milton.ca/en/live/roads.asp?mid=5783>

These sources were used to identify future projects and physical activities that CN considered in its project inclusion list for cumulative effects in the EIS. Each source above was reviewed to identify specific projects or activities in relation to the criteria provided in the OPS to determine whether they were “certain” or “reasonably foreseeable”. If they met the criteria provided in the OPS, the proposed project or activity was reviewed against the Project to determine whether the potential effects were likely to combine with the effects of the Project. The complete list of projects and activities used in the cumulative effects assessment, including a description of environmental effects and the rationale for inclusion and exclusion of each project per VC, was provided in response to CEAA IR25 (Attachment 25, CEAR #72).

### **Milton Education Village**

At the time of preparing the EIS, the MEV was not considered in the assessment of cumulative effects because the MEV was not considered a “certain and reasonably foreseeable” project based on the criteria provided in the OPS. While the concept of the MEV was identified as early as 2008, through the establishment of a memorandum of understanding between the Town of Milton and Wilfrid Laurier University, planning for the MEV was put on hold in 2012 in the absence of provincial funding (Town of Milton 2017) and funding was initially rejected by the province. Development plans were not available and planning approvals were not actively being sought for the MEV until funding could be established to make this project viable. The EIS was prepared and submitted to CEAA in December 2015.



Following a request for an expression of interest by the Ontario's Ministry of Advanced Education and Skills Development in October 2016, the Town of Milton "reinitiated the MEV Secondary Plan and supporting studies" in June 2017, together with related Regional and Local Official Plan Amendments and a Development Permit By-law (Town of Milton 2018a). The Secondary Plan process is currently underway as the Town of Milton works with Wilfred Laurier University, in partnership with Conestoga College, to develop a proposal while moving forward with the secondary planning process for this site and conducting financial impact studies for the MEV (Town of Milton 2018b). The Town of Milton held a community workshop on January 31, 2018 to solicit input from the community as they continue to develop ideas for the MEV (Town of Milton 2018a). Conceptual plans identifying 'conceptual precincts' (*i.e.*, potential land uses) within the MEV lands were presented during this community workshop for public review and feedback (Town of Milton 2018c). The boundaries of the MEV study area appear to have been refined in this latest information (*i.e.*, smaller and more precise than what was presented in earlier documentation).

Uncertainty surrounding the MEV should be acknowledged, as there are no defined / approved plans at this time. However, while funding was historically rejected by the Province, funding of \$90 million was confirmed by the Province on April 18, 2018 (Town of Milton 2018b). Of note, initial plans suggest that the Wilfred Laurier University campus proposed within the MEV will target Supply Chain Management, which could benefit from proximity to the Project. As such, CN has partnered with Wilfred Laurier University to provide positive opportunities for students to complement their theoretical learnings with practical experiences. CN has also partnered with Wilfred Laurier University to put on an annual Supply Chain Conference in Milton (3<sup>rd</sup> annual conference in 2018).

Although the MEV is still in its early planning phases, sufficient information is now available to describe the location, extent and general composition of the MEV. **Attachment IR5.3-1: Conceptual Plans for the Milton Education Village** identifies the location of the MEV lands, including the study area (*i.e.*, outer boundary of the MEV lands) and four proposed "precincts" for development (Town of Milton 2018c).

The following update to the cumulative effects assessment is provided to include the MEV.

### **Fish and Fish Habitat**

The MEV study area is located within the Indian Creek subwatershed, which was used as the RAA for the Project. Based on the proposed 'conceptual precincts' identified within the MEV study area (Town of Milton 2018c), Indian Creek occurs outside of the anticipated footprint of this project (see **Attachment IR5.3-1**). Based on this conceptual plan, there are no watercourses or fish habitat within the footprint of the MEV. Further, it is presumed that as development plans progress, the protection of the upper reaches of Indian Creek, through implementation of erosion and sediment control measures and the provision of stormwater management for water quality and quantity control, will be proposed by the proponent for the MEV in accordance with the Bronte Creek Watershed Study (CH 2002). As such, activities that could result in mortality to fish (e.g., in-water work, release of deleterious substances) are not anticipated for the MEV; therefore, the conclusions of the EIS (Section 6.6.1.1.4) remains unchanged, the total cumulative effects on fish and fish habitat in the RAA from the CN Project in combination with past, present, and certain and reasonably foreseeable future projects (including the MEV) are assessed to be not significant.



### **Migratory Birds**

Only a small portion (13 ha) of the Migratory Bird and Species at Risk RAA for this Project overlaps with the MEV lands (see **Attachment IR5.7-1**). Based on discussion provided in the response to **IR5.7**, and as illustrated on **Attachment IR5.7-1**, there is no grassland habitat (or other migratory bird habitat) within the MEV study area. As such, residual effects from the MEV on migratory birds are not anticipated.

### **Species at Risk**

Similar to migratory birds, effects from the MEV on grassland species at risk (*i.e.*, Bobolink and Eastern Meadowlark) are not anticipated to interact cumulatively with the effects from the Project due to the absence of grassland habitat within the MEV study area. There are no grasslands, woodlands or wetlands within the MEV study area (see **Attachment IR5.7-1**) and it is presumed that as development plans progress, any adjacent features that may contain species at risk would be reviewed and corresponding protection attributed to these features. No other species at risk habitat has been identified in the MEV study area (see response to **IR5.8**). As such, effects from the MEV on species at risk are not anticipated to interact cumulatively with the effects from the Project.

### **Human Health**

As noted in EIS Section 6.6.1.4.1, a potential cumulative effect may occur if a residual effect of the proposed Project is likely to act cumulatively with the effects of other physical activities. As the Project is predicted to have a negligible effect on human health, the Project is not likely to interact cumulatively with other physical activities. Therefore, a cumulative effects assessment was not undertaken.

### **Socio-economic Conditions**

Past, present and future projects have the potential to interact cumulatively with the Project through the conversion of agricultural land. The EIS (Section 6.6.1.5.2) predicted a 3% loss of agricultural lands within Halton Region as a result of the cumulative losses attributed to the Project in combination with the Boyne Survey Secondary Plan Area. Adding in the MEV to this calculation would not substantially change this percentage (*i.e.*, an additional loss of 145 ha associated with the MEV lands results in a 3.6% loss of agricultural lands within Halton Region. The loss of agricultural land within the RAA resulting from the certain and reasonably foreseeable future projects (including the MEV) is permanent, albeit in a limited amount.

Including the MEV in the determination of the loss of agricultural lands within the RAA does not change the conclusion of the EIS. Although the loss of agricultural land is considered adverse, permanent and irreversible, the loss of agricultural land is proposed to accommodate growth within areas already designated for development (*i.e.*, planned conversion determined through provincial and municipal plans / policies), and is therefore assessed as not significant, consistent with the conclusion of the EIS (see EIS Section 6.6.1.5). Further discussion in regard to the cumulative effects on the loss of agricultural land is provided in response to **IR5.6**.

## Archaeology and Cultural Heritage

As noted in EIS Section 6.6.1.6.1, a potential cumulative effect may occur if a residual effect of the proposed Project is likely to act cumulatively with the effects of other physical activities. As the Project is not predicted to have residual adverse effects on archaeology and cultural heritage, no cumulative effect is likely, and a cumulative effects assessment was not undertaken.

## Conclusion

Incorporation of the MEV into the assessment of cumulative effects of the Project in combination with past, present, and certain and reasonably foreseeable future projects does not alter the conclusions of the cumulative effects assessment presented in the EIS or subsequent responses to information requests (CEAA IR25-2, IR3.16 or IR4.29). For consistency, the MEV has been considered in the responses to **IR5.2** to **IR5.10**, inclusive, in this submission to the Panel.

Regarding the Panel's request in **IR5.2 (a)** to "Ensure that responses to all other information requests asking for a cumulative effects assessment reflect this directive", the information in the response to **IR5.2** provides additional information to above regarding use of a Selected Past Baseline for VCs subject to assessment of potential cumulative effects. The addition in the future of the MEV does not change the outcomes presented in the response to **IR5.2**.

*b) If additional certain or reasonably foreseeable projects and activities are identified within the official plans, update the cumulative effects assessment to indicate how the effects of those projects and activities would combine with the residual effects of the Project.*

CN completed the cumulative effects assessment based on the available certain or reasonably foreseeable future projects and activities that were identified in the official plans and were known at the time of preparing the EIS (*i.e.*, up to and including September 2015) (EIS Section 6.6.1). In response to this IR, a review of available public websites, planning documents and municipal plans identified in part a) was conducted to determine whether any additional certain or reasonably foreseeable future projects were identified between October 2015 and April 2018.

Based on this review, the following certain and reasonably foreseeable future project has been identified:

- Derry Green Corporate Business Park (Approved November 2015 through OPA 41) – The Derry Green Corporate Business Park Secondary Plan Area is located in the Milton Urban Expansion Area, east of the Bristol Survey (south of the 401, east of James Snow Parkway). This area is proposed to accommodate the majority of the Town's employment growth to the year 2021 (Town of Milton 2018d)

The location of this project, as well as the location of the MEV lands discussed in part a), in relation of the RAAs for each VC is identified on **Attachment IR5.3-2: Projects Considered for Cumulative Assessment (Revised)**.

Other potential future projects are not considered certain (*i.e.*, studies to determine whether they will proceed are not yet approved, or approval is not yet pending) or reasonably foreseeable (*i.e.*, construction / operation dates are not yet confirmed or known). For example, the South East Milton Urban Expansion Area identified in ROPA 38 as an area to accommodate population and employment growth in the Town of Milton from 2021 through to 2031 (Town of Milton 2018e) is not



certain or reasonably foreseeable. While background studies have been initiated by the Town of Milton to identify key opportunities and constraints to developing this area (i.e., subwatershed study and land base analysis), plans outlining how these lands will develop have not yet been advanced. The secondary plan process for communities within this area is scheduled to commence in early 2018 (Town of Milton 2018e), with conceptual planning areas identified for the Britannia East/West Secondary Plan Area, Trafalgar Corridor Secondary Plan Area, and Agerton Employment Secondary Plan Area. However, until background studies are completed to understand opportunities and constraints for future development in these areas, and until the corresponding secondary plans for these areas are developed and approved (or pending approval), these characteristics, potential effects and timing of these future potential developments will remain uncertain. As such, the ability to determine whether the effects of these potential developments could interact cumulatively with the residual effects of the Project are uncertain and therefore excluded from the cumulative effects assessment.

Since September 2015, roadway improvement projects have been approved under the Municipal Class EA process within the socio-economic RAA (e.g., upgrades to Dundas Street (Oakville), Trafalgar Road and Ninth Line), and others are in progress (e.g., upgrades to Regional Road 25, Winston Churchill Boulevard, and Steeles Avenue). These roadway improvements (roadway widenings) and corresponding potential effects were originally considered in the cumulative effects assessment in the EIS as 'urban and rural road upgrades' planned prior to 2025 (EIS, Table 6.2; Revised Table 6.2, Attachment IR25 in response to IR25, CEAR #72). The increased traffic anticipated to be accommodated by these planned roadway upgrades have been considered to some degree through the future traffic predictions considered in the Transportation Considerations report provided in response to IR2.33 (Attachment IR2.33-3, CEAR #592).

All responses to subsequent information requests related to the CEA reflect the additional certain and reasonably foreseeable future projects described above (i.e., MEV and Derry Green Corporate Business Park).

Regarding the Panel's request in **IR5.2 (a)** to "Ensure that responses to all other information requests asking for a cumulative effects assessment reflect this directive", the information in the response to **IR5.2** provides additional information to above regarding use of a Selected Past Baseline for VCs subject to assessment of potential cumulative effects. The addition in the future of the MEV and Derry Green Corporate Business Park does not change the outcomes presented in the response to **IR5.2**.

#### **IR5.4 Light**

**Rationale:** *In subsection 6.4.1.3 of the EIS, and Appendix E.8, CN described Project light effects during construction and operation. CN stated that once operational, the Project would add additional background light to the area, but it was estimated to be below guidelines. CN did not include a cumulative effects assessment of the Project's light effects in combination with existing and planned lighting infrastructure in the Project's vicinity.*

*In comments to the Canadian Environmental Assessment Agency on the project description and on the draft Environmental Impact Statement Guidelines, participants raised the concern that increased light from the Project might also affect stargazing in the area (CEAR #26 and #37). CN did not assess the effects of Project light, in combination with projects and activities that have been or will be carried out, on recreational stargazing.*



**Information Request:**

- a) *Provide a cumulative effects assessment for light, taking into consideration planned future development in the Project vicinity including roadway lighting. The assessment should include factors such as glare, light spill and skyglow. The assessment should consider the effects of this lighting on nearby residences, stargazing as a recreational activity and wildlife such as migratory birds.*

**CN Response:**

The following response is in two parts:

1. **Cumulative Effects Assessment:** addresses the request made in IR5.4(a), and as such offers a quantitative based approach.
2. **Modified Cumulative Effects Assessment:** provides a response that addresses the requests made in IR5.4(a) and in IR5.2 regarding inclusion of a “selected past condition”, and as such offers a largely qualitatively based approach.

**Cumulative Effects Assessment**

As discussed in response to IR4.2 (c), a quantitative sky glow assessment for the Project has been completed and provided as Attachment IR4.2-1: Sky Glow Assessment. This assessment includes consideration of existing light conditions, the Project, and planned future development in the Project vicinity, including roadway lighting, to quantitatively assess the potential cumulative effects for light.

On behalf of CN, Stantec conducted initial sky quality measurements at and near the Project site in Summer 2014. During the 2014 timeframe, the following activities were underway near the project:

- Roadway expansions (Louis St. Laurent Avenue and Tremaine Road expansions – including the installation of extensive lighting – not yet operational in 2014).
- Residential subdivisions were being constructed at locations near the Project site (subdivision street lighting was not yet operational in 2014), and,
- The construction of the Velodrome, with landscape lighting not yet operational in 2014.

Sky quality measurements were made during the Spring of 2018, to capture the lighting changes as of 2018 (more lighting) to provide an updated and more realistic “existing” condition for comparison.

The contribution of the Project and other future projects to the updated background provides an assessment of the cumulative effects.

The Project lighting contribution to sky glow was predicted using a mathematical model (Garstang 1986). Inputs to the model were based on the same project lighting equipment plan that was documented in the Light TDR (EIS Appendix E.8).



Future lighting from certain and reasonably foreseeable future projects that may contribute cumulatively to future sky quality were considered. It was assumed that the future Britannia Road lighting would be similar to what was identified in the April 2014 Halton Region Environmental Study Report, and this was included in the future sky quality prediction. The other known future lighting sources in the area pertain to future developments, including lighting within the Boyne Secondary Plan Area (*i.e.*, subdivision expansions now underway north of Britannia Road), the future Milton Education Village and the Derry Green Corporate Business Park. Assumptions were made to consider the future addition of lighting for these developments based on similar installations located nearby.

In the assessment provided in Attachment IR4.2-1, it is noted that the existing lighting + Project lighting + future lighting are part of a consistent trend where the sky quality (measured in mag/arcsec<sup>2</sup>) values are decreasing over time, as development in the urbanizing environment continues. A lower value of sky quality indicates an increase in night sky brightness. The increased brightness would be perceived as increased sky glow. **Table IR5.4-1** (taken from Attachment IR4.2-1) presents both the measured and predicted sky glow at locations close to the Project.

**Table IR5.4-1 Summary - Sky Quality Measurements and Predictions**

Site	Measured Sky Quality 2014 (mag/arcsec <sup>2</sup> )	Measured Sky Quality 2018 (mag/arcsec <sup>2</sup> )	Predicted Sky Quality 2021 (mag/arcsec <sup>2</sup> )	Predicted Sky Quality 2021 With Project (mag/arcsec <sup>2</sup> )	Predicted Sky Quality (2031)* (mag/arcsec <sup>2</sup> )
1	19.34	19.12	18.80	18.62	18.47 - 18.32
2	19.43	19.22	18.90	18.77	18.62 - 18.47
3	19.4	19.20	18.88	18.74	18.59 - 18.44
4	19.37	19.11	18.79	18.66	18.51 - 18.36
5	19.37	19.17	18.85	18.74	18.59 - 18.44
6	19.31	18.77	18.45	18.30	18.15 - 18.00
7	19.44	19.05	18.73	18.63	18.48 - 18.33
8	19.46	18.94	18.62	18.52	18.37 - 18.22

\*approximation, no detailed plans of future development have yet been identified

The change in sky quality is representative of change in sky glow, but with an inverse relationship. That is, as sky quality measurement in units of mag/arcsec<sup>2</sup> decreases, the sky brightness or sky glow increases. As shown in the table, the change in sky quality predicted with the Project is small, approximately 1% of the sky quality measure of light conditions expected in 2021.

#### *Effects on Nearby Residences*

Glare and the cumulative aspect of glare were discussed in the response to IR4.2 (d). Glare results from the contrast of a bright illumination source observed with the surrounding darkness. It is related to misdirected light that is also considered light spill or trespass. It is exemplified by the discomfort experienced as eyes strain to adjust to distinguish detail in both the bright and dark areas. The discomfort of glare is actually reduced as more light is available, reducing contrast. Adding more light is an inefficient way to reduce glare. Instead, the use of directed and shielded light, focused on the area requiring illumination, is the most efficient and effective way to reduce glare.

Light spill and trespass were assessed in the Light TDR (EIS Appendix E.8), as well as IR4.2 (d). Light trespass is simply misdirected or poorly focused light that spills from luminaires to areas where it is not required and is an indication of inefficient and ineffective lighting implementation. At this time, CN is proposing adjustable shielded luminaires with full cutoff, downlighting, and a set back from the project development boundary to have the lowest practical potential for light spill from the Project to neighbours. The adjustable shielding provides a secondary means to adjust and mitigate should the luminaire locations in relation to finalized facility operations result in any unexpected spill or trespass.

The application of lighting technology for the ongoing street lighting along Britannia Road and other future developments (proposed by others) is assumed to continue the use of luminaires with suitable efficient lighting (illumination pattern only as required, full cutoff and shielded) to continue to minimize unnecessary light spill and glare for any nearby residences or receptors. This will ensure that combined lighting impacts on nearby residences are minimized.

#### *Effects on Stargazing*

Conclusions on the approximate visibility of stars in the night sky are also provided in Attachment IR4.2-1. Based on the measured values of current sky quality, the known changes already underway to the lighting in the area without the Project, with the Project, and with future expected changes associated with the certain and reasonably foreseeable future projects to the year 2031, it will still be possible to view approximately 500 stars on nights with good viewing conditions. Using the assumptions above, and the predicted values from the assessment, the potential to star gaze will remain essentially consistent in terms of sky quality or sky glow. This can be concluded by referring to Figure 1 of the Sky Brightness Nomograph (provided in Attachment IR4.2-1).

In arriving at this conclusion, it was assumed that any future night sky viewing would be carried out during favorable weather conditions and from a location with shading from glare or trespass, with a clear view of the sky.

#### *Effects on Migratory Birds*

For migratory birds, the effect of Project lighting during operation was assessed in the EIS (Section 6.5.2.9), and further discussed in response to CEAA IR25 (CEAR #[375](#)) and IR4.3. The assessment concluded the Project could result in sensory disturbance to migrating birds through attraction to Project lighting; however, with implementation of lighting mitigation measures (i.e., efficient Terminal lighting, downward facing lighting), this change is anticipated to be minimized, whereby the residual effects of the Project on migratory birds were predicted to be not significant (EIS Section 6.5.2.9; see also response to CEAA IR25 (CEAR #[375](#)) and IR4.3). The conclusion of the supplementary sky glow assessment in Attachment IR4.2-1 is that the Project contribution to cumulative sensory disturbance of migratory birds is not significant.

#### **Modified Cumulative Effects Assessment**

The response above (drawing on the response to IR4.2) considered existing light conditions, the Project, and planned future development in the Project vicinity, including roadway lighting, to quantitatively assess the potential cumulative effects for light. The remainder of this response provides a qualitative discussion of cumulative effects in the light environment relative to the Selected Past Baseline in keeping with the Review Panel's directive in **IR5.2 (a)**. The response to **IR5.2** provides a general description of changes to the environment from historical conditions



through European settlement and Selected Past Baseline conditions to today, which reflect a change from the original forested landscape to a largely rural agricultural landscape and town with rail access to an urbanized setting as part of the Greater Toronto and Hamilton Area (GTHA).

#### *Selected Past Baseline to Present Conditions*

Lighting and luminaire technology commonly available in the 1950s is known to be inefficient; upcast light, spill, and limited ability to direct and control illumination because of the heat related to illumination technology were technology problems that have been addressed with modern design. The understanding of good lighting design has resulted in more effective and efficient application of lighting technology. Mitigation of unwanted effects of lighting that include misdirected light causing unwanted sky glow, glare or unnecessary spill is possible based on new illumination technology and available knowledge of the efficient and effective application of the technology.

In the 1950s, urban areas were more concentrated on the shoreline of Lake Ontario reaching out from Toronto and Hamilton and to a lesser extent in smaller towns and hamlets within the Halton Region. It is anticipated that the number of light sources and associated light emissions would have been less throughout the Region at that time. Since the 1950s, there would have been an increase in the number of light sources as the Region, including the Town of Milton, expanded urban development since the time of the selected baseline. The result of these increased light sources would be an increase in sky glow and change in sky quality as a result of this growth and urbanization.

#### *Changes as a Result of the Project*

As described in the initial part of this response and in more detail in the response to IR4.2, the Project will add light sources to the PDA, which will slightly decrease sky quality through a small increase in sky glow. The integration of modern dark-sky-friendly lighting technologies into Project design will avoid glare and minimize light spill from the Project.

#### *Future Conditions*

As described in the initial part of this response, the future conditions of the light environment will be further affected by other known future certain and reasonably foreseeable projects including lighting associated with planned Britannia Road expansion, Boyne Secondary Plan Area (*i.e.*, subdivision expansions now underway north of Britannia Road), the future Milton Education Village and the Derry Green Corporate Business Park. Light from these sources will further contribute to the trend in decreasing sky quality related to urban development. These other projects are assumed to integrate modern lighting technology.

#### *Assessment of Cumulative Effects*

Past, present and future activities contributing to the light environment have been summarized above. Potential cumulative effects based on these activities include effects of increased sky glow, light spill and trespass on nearby receptors, stargazing and migratory birds. Each are described below.

### *Effects on Nearby Residences*

Taking regional urban development from Selected Past Baseline to Future into account, total cumulative effects of light have occurred but are now addressed by selecting luminaires with full cut off to minimize light cast to the sky, reducing unwanted increases in night sky brightness. The Project contribution to this effect, given its engineering design, including planned use of modern dark-sky-friendly lighting technology and design to avoid glare and minimize off-site light spill, is negligible.

### *Effects on Stargazing*

Given regional urban development from Selected Past Baseline to Future, total cumulative effects of light (specifically, sky glow) on stargazing have in general resulted in diminishing quality of this experience. However, the Project contribution to these effects, given its engineering design, including planned use of modern dark-sky-friendly lighting technology and design to avoid glare and minimize off-site light spill, is negligible.

### *Effects on Migratory Birds*

Given regional urban development from Selected Past Baseline to Future, total cumulative effects of light on migratory birds have in general resulted in progressively greater adverse effect on migratory bird navigation. However, the Project contribution to these effects, given its engineering design, including planned use of modern dark-sky-friendly lighting technology and design, is negligible.

## **IR5.5 Human health**

**Rationale:** *In subsection 6.6.1.4 of the EIS, CN stated that a cumulative effects assessment of human health was not undertaken because residual Project effects on human health were likely to be negligible.*

*In subsection 6.5.4.9.3 of the EIS, CN stated that potential health risks were identified as a result of predicted changes to air quality after the consideration of mitigation measures. In Section 6.2 of Appendix E.7 to the EIS, CN stated that exceedances of air quality benchmarks were predicted to be infrequent.*

*In Section 6.2 and 6.3 of Appendix E.7 to the EIS, CN stated that the incremental lifetime cancer risk for carcinogenic chemicals of potential concern was below the target benchmark and health risks were not expected from inhalation of benzene and benzo(a)pyrene at special receptor locations for the Project Alone scenario. In its submission to the Review Panel on the sufficiency of the EIS (CEAR #533), Health Canada stated that this is inaccurate because cancer is non-threshold and not exceeding the target benchmark does not indicate there is zero cancer risk. Any increase to the incremental lifetime cancer risk should therefore be considered as a residual effect of the Project.*

*The Canadian Environmental Assessment Agency technical guidance – Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 (CEAR #571) indicates that a cumulative effects assessment should consider those valued components for*

*which residual environmental effects are predicted after consideration of mitigation measures, regardless of whether those residual environmental effects are predicted to be significant.*

*Infrequent exceedances of health-based guidelines represent residual effects which could act cumulatively with the effects of other physical activities and cause effects to human health.*

**Information Request:**

- a) *Conduct a cumulative effects assessment for human health that considers all residual effects of the Project on human health, including any increases to the incremental lifetime cancer risk, regardless of whether target benchmarks or thresholds are exceeded.*

*If applicable, in developing the response to this information request, consider responses to other information requests in package 4.1, namely information request 4.27 (Exposure pathways to human health effects)*

**CN Response:**

The following response is in two parts:

1. **Cumulative Effects Assessment:** addresses the request made in **IR5.4 (a)**, and as such offers a quantitative based approach.
2. **Modified Cumulative Effects Assessment:** provides a response that addresses the requests made in **IR5.4 (a)** and in **IR5.2** regarding inclusion of a “selected past condition”, and as such offers a largely qualitatively based approach.

**Cumulative Effects Assessment**

The response to IR4.27 provided clarification that inhalation is the appropriate pathway to consider for the Project and that absorption through the inhalation pathway was assumed to be 100%.

As part of the response to IR4.29, CN conducted a cumulative effects assessment for human health, for all of the identified chemicals associated with the Project, regardless of whether or not they were considered to have residual effects in the Human Health Risk Assessment (HHRA) (EIS Appendix E.7), and regardless of whether or not such residual effects were considered significant (*i.e.*, above target benchmarks or thresholds). The cumulative effects assessment for human health is based on responses to IR3.16, where predicted ground level concentrations of chemicals were provided for 98 special receptor locations (*i.e.*, 40 HHRA receptors and 58 Traffic receptors), for two time periods (in 2021 and 2031) for Baseline, CN Project Case (no offsite traffic), Project-related off-site truck traffic, CN contribution (Project + Project-related offsite truck traffic), future regional traffic, and a cumulative effect assessment case (*i.e.*, CN contribution + future traffic + baseline). The Panel is directed to those IR responses for details of the cumulative effects assessment.

The following text provides a summary of those IR responses as it pertains to this IR; namely, the cumulative effects assessment for human health that considers residual effects of the Project on human health, including any increases to the incremental lifetime cancer risk.



## 2021

For the cumulative effects assessment case (and other modelled cases) in 2021, exposure ratios (ERs) for short-term and long-term exposures at the 98 special receptor locations were less than or equal to the applicable target benchmark (*i.e.*, ER less than or equal to 1.0 for chemicals of potential concern with measured baseline data or ER less than or equal to 0.2 for chemicals of potential concern with no measured baseline data) for NO<sub>2</sub>, CO, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, 1,3-butadiene, benzene, acrolein, acetaldehyde, and formaldehyde (refer to Table 4: Maximum Exposure Ratios for the 98 PORs for the year 2021, provided in Attachment IR4.29-1 in response to IR4.29).

ERs greater than 1.0 were calculated for benzo(a)pyrene in the cumulative case for 24 hour and annual average time periods. These ERs can be viewed as a cumulative indicator of risk since they were calculated as the sum of risks associated with baseline conditions, Project and Project-related (*i.e.*, offsite truck traffic) contributions, and future regional traffic. The calculated incremental lifetime cancer risk (ILCR) directly contributed by the Project or Project-related off-site truck traffic for benzo(a)pyrene is 1.33E-09 (*i.e.*, the potential increase in cancer risk of 1.33 in a billion people; refer to Table 6: Maximum Incremental Lifetime Cancer Risks for Project Related Emissions in 2021, provided in Attachment IR4.29-1 in response to IR4.29). This ILCR is considered negligible (very low) when compared to the Health Canada threshold.

By adding this ILCR to the current risk of developing cancer in Canada, inference about the “cumulative” risk of developing cancer over a lifetime with the addition of Project-related emissions can be made. About 1 in 2 (approximately 50%) Canadians will develop cancer in their lifetimes (Canadian Cancer Society 2018). Thus, the “cumulative” risk of developing cancer over a lifetime with the addition of Project-related emissions is 50.000000133%.

## 2031

For the cumulative effects assessment case (and other modelled cases) in 2031, ERs for short-term and long-term exposures at the 98 special receptor locations were less than or equal to the applicable target benchmarks for NO<sub>2</sub>, CO, SO<sub>2</sub>, PM<sub>2.5</sub>, 1,3-butadiene, benzene (24-hour), acrolein, acetaldehyde, and formaldehyde (refer to Table 7: Maximum Exposure Ratios for the 98 PORs for the year 2031, provided in Attachment IR4.29-1 in response to IR4.29, CEAR #[632](#)).

For PM<sub>10</sub>, an ER greater than 1.0 was calculated for one of the 98 modelled special receptors in the cumulative effects assessment case only. At this receptor location, the ER calculated for baseline is the same as the ER calculated for the cumulative effects assessment. This means PM<sub>10</sub> is not expected to change baseline risks with the addition of Project, Project-related (*i.e.*, off-site truck traffic), and future regional traffic (refer to Table 7: Maximum Exposure Ratios for the 98 PORs for the year 2031, provided in Attachment IR4.29-1 in response to IR4.29, CEAR #[632](#)).

ERs greater than 1.0 were also observed for benzene and benzo(a)pyrene at all 98 special receptor location for the cumulative case; however, this result was driven entirely by baseline concentrations and not by the addition of CN and future traffic contributions. For example, the benzene ER for baseline (1.8) is the same as the benzene ER for the cumulative effects case (1.8). For benzo(a)pyrene, the ERs for baseline (13 for 24-hr exposure; 25 for annual average exposure) are essentially the same as the benzo(a)pyrene ER for the cumulative effects case (14 and 26). In other words, the addition of CN and future traffic contributions did not change (in the case of benzene), or did not change appreciably (in the case of benzo(a)pyrene), the baseline ER (refer

to Table 7: Maximum Exposure Ratios for the 98 PORs for the year 2031, provided in Attachment IR4.29-1 in response to IR4.29, CEAR # [632](#)].

For benzene and benzo(a)pyrene emissions directly related to the Project or Project-related offsite truck traffic (i.e., CN contribution), ILCRs were calculated. The ILCRs directly contributed by the Project or Project-related offsite truck traffic for benzene and benzo(a)pyrene are 3.6E-08 (i.e., the potential increase in cancer risk of 3.6 in one hundred million people) and 2.5E-10 (i.e., the potential increase in cancer risk of 2.5 in 10 billion people), respectively (refer to Table 9: Maximum Incremental Lifetime Cancer Risks Carcinogenic Health Risks for Project Related Emissions in 2031 Operations Scenario (Year 2031) – Long-term Exposure provided in Attachment IR4.29-1 in response to IR4.29). These ILCRs are considered negligible (very low) when compared to the Health Canada threshold.

By adding these ILCRs to the current risk of developing cancer in Canada, inference about the "cumulative" risk of developing cancer over a lifetime with the addition of Project-related emissions can be made. The "cumulative" risk of developing cancer over a lifetime with the addition of Project-related emissions of benzene is 50.0000036% and 50.00000025% for benzo(a)pyrene.

### Modified Cumulative Effects Assessment

The initial part of this response above (drawing on the response to IR4.29) considered the effects of the Project in combination with existing and future conditions. The remainder of this response provides a qualitative discussion of cumulative effects on human health relative to the selected past baseline in keeping with the Review Panel's directive in **IR5.2 (a)**. The response to **IR5.2** provides a general description of changes to the environment from historical conditions through European settlement and selected past baseline conditions to today, which reflect a change from the original forested landscape to a largely rural agricultural landscape and town with rail access to an urbanized setting as part of the Greater Toronto and Hamilton Area (GTHA).

#### *Selected Past Baseline to Present Conditions*

As outlined in response to **IR5.2**, residential growth including increased population and change from rural town to an urbanized environment occurred in Milton after the expansion of transportation networks across the province, including Highway 401. This urban expansion encouraged infrastructure development that generally increased the quality of health for residents in the Region. This growth was also accompanied by greater demands on the transportation system, increased number of personal and commercial vehicles and growth in the industrial and manufacturing sectors that increased emissions and discharges. These changes are being managed through the introduction of regulatory controls and education programs that support a healthy lifestyle (e.g., improved technologies for emission controls, monitoring programs for municipal utilities including water, drive clean programs for vehicle emissions, improved public transit systems, renewable energy, and conservation).

In addition, the government health system, including greater access to health care, has improved since the time of the Selected Past Baseline. The following are examples of such progress:

- More Ontarians have a family doctor today than they did in 2004 (<https://www.ontario.ca/page/progress-report-2014-health-care>).



- Lung cancer rates have decreased in both Ontario and Halton between 1986 and 2012. There has been consistent improvement in the state of air quality in Ontario between 1971 (when air quality monitoring started) to today, despite significant increases in population, economic activity and vehicle-kilometers travelled (<http://www.airqualityontario.com/downloads/AirQualityInOntarioReport2002.pdf>).
- As of 2014 Ontario has introduced nearly 70 new or updated air pollution standards since 2005. Overall, air quality in Ontario has improved significantly over the past 10 years due to substantial decrease in harmful pollutants that are emitted by vehicles and industry. (<http://www.airqualityontario.com/press/publications.php>), (<https://www.ontario.ca/page/progress-report-2014-health-care>)

### *Changes as a Result of the Project*

As described in the initial part of this response, the calculated ILCR directly contributed by the Project or Project-related off-site truck traffic for benzo(a)pyrene (the only parameter for which ERs were calculated to be greater than 1.0) is 1.33E-09 (*i.e.*, the potential increase in cancer risk of 1.33 in a billion people), which is considered negligible (very low) when compared to the Health Canada threshold. By adding the calculated ILCR in 2021 to the current risk of developing cancer in Canada, inference about the “cumulative” risk (Project + past) of developing cancer over a lifetime with the addition of Project-related emissions can be made. About 1 in 2 (approximately 50%) Canadians will develop cancer in their lifetimes (Canadian Cancer Society 2018). Thus, the “cumulative” risk of developing cancer over a lifetime with the addition of Project-related emissions to existing conditions, reflecting the effects of other projects and activities that have been carried out is 50.000000133%.

### *Future Conditions*

As described in the initial part of this response, the addition of Project, Project-related (*i.e.*, off-site truck traffic), and future regional traffic in 2031 is not expected to change baseline risks for human health with respect to PM<sub>10</sub> (for which an ER greater than 1 was calculated for one of the 98 modelled special receptors in the cumulative effects assessment case only).

ERs greater than 1.0 were also observed for benzene and benzo(a)pyrene at all 98 special receptor location for the cumulative case; however, this result was driven entirely by baseline concentrations and not by the addition of CN and future traffic contributions.

### *Assessment of Cumulative Effects*

By adding the calculated ILCRs for 2031 to the current risk of developing cancer in Canada, inference about the “cumulative” risk of developing cancer over a lifetime with the addition of Project-related emissions can be made. The “cumulative” risk of developing cancer over a lifetime with the addition of Project-related emissions of benzene is 50.0000036% and 50.00000025% for benzo(a)pyrene. Overall, results of the cumulative HHRA indicate that Project-related emissions are expected to result in negligible changes to human health.

An equivalent degree of analysis into the past, specifically to the Selected Past Baseline, is not possible given lack of equivalently specific descriptive data. However, the aforementioned generalized description of Selected Past Baseline to Present Conditions suggests a trend of improving certain health condition given implementation of various public health and other measures. As such, total cumulative effects (Selected Past Baseline to Future) on human health



has generally, on balance, improved notwithstanding substantial urban growth and other development. However, the Project contribution to these effects is negligible.

#### **IR5.6 Agricultural areas**

**Rationale:** In subsection 6.5.5.9.3 of the EIS, CN stated that the Project would result in the loss of 30 hectares of designated agricultural areas that overlap with the project development area. CN indicated that this represents approximately 0.1% of the total agricultural land within the regional assessment area, but did not provide information on the existing lands in the regional assessment area.

In subsection 6.6.1.5.2, CN stated that the conversion of agricultural land is predicted to be an adverse cumulative effect. CN determined that the construction of the Boyne Survey Secondary Plan Area residences would result in the conversion of 3% of agricultural land within Halton Region.

CN did not provide a cumulative effects assessment for agricultural lands in its EIS. If the Project is predicted to result in a residual loss of 30 hectares of designated agricultural areas, CN should consider this effect in the context of past and reasonably foreseeable future losses and socio-economic effects on farmers or communities in the regional assessment area.

#### **Information Request:**

- a) Explain how CN calculated that the conversion of 30 hectares represents approximately 0.1% of the total agricultural land within the regional assessment area.
- b) Conduct a cumulative effects assessment for agricultural lands that describes past and reasonably foreseeable future conversions of lands used for agricultural purposes in the regional assessment area, regardless of whether these lands were classified as Agricultural Areas or Prime Agricultural Areas. Describe the socio-economic effects of the past and anticipated future conversions in the regional assessment area.

#### **CN Response:**

- a) Explain how CN calculated that the conversion of 30 hectares represents approximately 0.1% of the total agricultural land within the regional assessment area.

Additional details of how the conversion of 30 ha represents approximately 0.1% of the total agricultural land in the RAA are provided in the responses to IR4.19 and IR4.20. This area, 30 ha within the PDA, represents the amount of prime agricultural land identified within the Halton Region Official Plan (Halton ROP, March 2015) that will be removed by the Project. Compared to the total prime agricultural land available in the RAA (i.e., 26,307 ha as identified in Table IR4.19-1 provided in response to IR4.19), 30 ha represents approximately 0.1% of the total available "prime agricultural" area (i.e.,  $30 / 26,307 = 0.0011$  or 0.1%) as classified by the Halton ROP.

These numbers do not account for overlapping land classifications by the Region (e.g., prime agricultural land that is identified for future strategic employment land and prime agricultural land where other facilities currently exist, such as the Halton Waste Management Facility or the Burlington Airpark Airport) (Halton ROP, March 2015).



- b) *Conduct a cumulative effects assessment for agricultural lands that describes past and reasonably foreseeable future conversions of lands used for agricultural purposes in the regional assessment area, regardless of whether these lands were classified as Agricultural Areas or Prime Agricultural Areas. Describe the socio-economic effects of the past and anticipated future conversions in the regional assessment area.*

As provided in the EIS, Section 6.6.1.5, a cumulative effects assessment was completed for a change in the quality and quantity of land and resource (*i.e.*, including loss of agricultural land) and was further described in the "Agricultural Conversion" physical activity in response to CEEA IR25 (CEAR #72, Attachment IR25) and CEEA IR25 (CEAR #375 – Socio-Economic Conditions).

#### *Selected Past Baseline to Present Conditions*

As noted in response to **IR5.2**, the Town of Milton had approximately 145 ha of development extent in 1954, surrounded by rural, agricultural fields and fragmented woodlots, and windrows (see **Attachment IR5.2-1**). Following construction of Highway 401, and after installation of "the big pipe" in 2000, Milton became one of Canada's fastest growing municipalities resulting in the expansion of urban boundaries and conversion (development) of agricultural lands to accommodate growth. This growth and development was purposeful and planned by the Province, Region and Town. While the past conversion of land from the "selected past baseline condition" to present day conditions has not been quantified, agricultural fields were more extensive in the 1950s and a change based on urban development and other land and resource use has resulted in the existing landscape. Based on aerial photo review (see Attachment IR5.2-1), the PDA in the 1950s has largely remained unchanged, while development from the Town of Milton has moved east and south towards the location of the PDA. This change has been purposeful and is a result of regional and municipal planning and a change from rural to urban landscapes experienced across the GTHA since the time of the selected past baseline. A discussion on the selected past baseline and changes to agricultural land use are provided in response to IR 5.2.

#### *Changes as a Result of the Project*

As a result of the Project, 147 ha of lands currently used for agriculture will be converted (*i.e.*, regardless of whether these lands were classified as Agricultural Areas or Prime Agricultural Areas). Further discussion regarding the Project-related effects of this conversion of agricultural land are provided in response to IR4.20.

#### *Future Conditions*

Based on the certain and reasonably foreseeable projects identified in the EIS (see Revised Table 6.2, Attachment IR25, provided in response to CEEA IR1, CEAR#72), and taking into consideration the additional certain and reasonably foreseeable projects identified in response to **IR5.3**, a total of 1,732 ha of agricultural land within the RAA, including lands currently used for agriculture within the PDA, will be converted, as follows:

- the Project (147 ha);

- Boyne Survey Secondary Plan Area (930 ha<sup>1</sup>);
- Milton Education Village (145 ha<sup>2</sup>); and,
- Derry Green Corporate Business Park (510 ha<sup>3</sup>).

These values are based on the calculation of agricultural lands (*i.e.*, lands currently used for agriculture) regardless of whether these lands are designated as Agricultural Areas or Prime Agricultural Areas within the Halton ROP or Milton OP. It is important to note that all of these lands (1,732 ha) have been designated for future development to accommodate planned growth and urban expansion within the Town of Milton and therefore are expected to be lost from agricultural use, regardless of whether the Project proceeds. The total area of agricultural land within the RAA designated as either "Prime Agricultural Areas" or "Agricultural System Outside Prime Agricultural Areas" in the Halton ROP is approximately 36,011 ha (see response to IR4.19). This excludes lands currently used for agriculture that occur in areas designated for future development, such as lands within proposed urban expansion areas (*i.e.*, lands designated for future development) where agricultural activities are considered a temporary land use.

Of the 1,732 ha of agricultural land affected by these certain and reasonably foreseeable future projects, only the 30-ha area within the PDA is included in the 36,011 ha designated as either "Prime Agricultural Areas" or "Agricultural System Outside Prime Agricultural Areas" in the Halton ROP (although these same 30 ha are also identified as Future Strategic Employment Lands in the Halton ROP, suggesting these lands will also be developed as part of the Region's long-term growth plan and would not be available for agricultural land use in the future, regardless of the Project). No additional lands designated as "Prime Agricultural Areas" or "Agricultural System Outside Prime Agricultural Areas" within the RAA will be lost as a result of the certain and reasonably foreseeable future projects. As such, the cumulative loss of land designated for long-term agricultural use (*i.e.*, designated as either "Prime Agricultural Areas" or "Agricultural System Outside Prime Agricultural Areas" in the Halton ROP) within the RAA (*i.e.*, Halton Region) resulting from the certain and reasonably foreseeable future projects, including the Project, is 0.08% (*i.e.*,  $30/36,011 \text{ ha} = 0.0008$  or 0.08%).

#### *Assessment of Cumulative Effects*

The EIS (Section 6.6.1.5.2) predicted a 3% loss of agricultural lands within Halton Region as a result of the cumulative losses attributed to the Boyne Survey Secondary Plan Area and the Project (*i.e.*,  $1,077 \text{ ha}/36,011 \text{ ha} = 3.0\%$ ). Adding in the loss of an additional 655 ha of land used for agricultural production associated with the MEV and Derry Green Corporate Business Park to this calculation would not substantially change this percentage (*i.e.*, an additional loss of 655 ha associated with the MEV and Derry Green Corporate Business Park lands results in a 4.8% loss of agricultural lands within Halton Region (*i.e.*,  $1,732/36,011 = 4.8\%$ ). However, this percentage loss pertains to the percentage of lands currently used for agriculture in the Region, not the lands designated for long-term agricultural use. As noted above, only 30 ha of the land to be lost due to the Project and

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<sup>1</sup> Based on air photo interpretation (1984) of the Boyne Survey – considered as a future project although construction is now underway (assumed all areas used for agricultural would be developed for another purpose)

<sup>2</sup> Based on current air photo interpretation of the MEV study area (in the absence of detailed design plans, assumed all areas used for agricultural would be developed for another purpose).

<sup>3</sup> Based on current air photo interpretation of the Derry Green area (in the absence of detailed design plans, assumed all areas used for agricultural would be developed for another purpose).

other certain and reasonably foreseeable projects is designated for long-term agricultural use, which represents a loss of 0.08% (and even those lands are identified as future strategic employment lands). The loss of agricultural land within the RAA resulting from the Project in combination with certain and reasonably foreseeable future projects is permanent, albeit in a limited amount, and located in areas already designated by the Halton Region and Town of Milton for urban expansion.

Other certain and reasonably foreseeable future projects identified in Revised Table 6.2 (Attachment IR25, CEAR #72) are not expected to result in a loss of agricultural land. The cumulative loss of agricultural land based on the Project in combination with certain and reasonably foreseeable future projects is set to occur within areas already set aside for urban growth in the Town of Milton (EIS, Section 6.6.1.5; see also response to IR4.21). The extent and location of development to accommodate this growth was informed by the Sustainable Halton: Agricultural Countryside Vision (Halton 2007). This report was prepared and used by the Region to guide discussions and became part of the framework for the Halton Region Official Plan, Amendment 38, considering the effect of future agricultural conversion to accommodate urban growth on primarily agricultural lands in the RAA. The Halton Region (2007) report provided guidance to the Halton Region and planning committees for each municipality within the Region on how to achieve a "Sustainable Halton" in which "development of urban growth and other land uses can continue without compromising the permanent presence of agriculture production in the region".

The land supply study conducted as part of the Sustainable Halton process estimated that 3,000 to 4,200 ha of the Region would be required to accommodate urban land needs to 2031, which would leave 7,000 to 10,000 ha of land available for agriculture (Halton 2007). Halton Region (2007) noted that if managed carefully and combined with the rural area set aside in the Greenbelt, this area (*i.e.*, the remaining 7,000 to 10,000 ha) would allow for the continuation of a viable agricultural sector in the area. This study was prepared with an acknowledgment of CN's plans for the development of an intermodal facility in southwest Milton (Halton 2007). As such, the conversion of agricultural land for the Project, as well as to accommodate the certain and reasonably foreseeable future projects described above, all of which occur on lands proposed for urban growth in the Halton ROP (and Town of Milton OP), should not affect the viability of agriculture in the RAA (*i.e.*, within Halton Region). This conversion away from agriculture was accounted for by the Region of Halton and Town of Milton when determining the future use of these lands.

The cumulative loss of agricultural lands will be adverse, low in magnitude, permanent and irreversible, but proposed within an area that has been substantially previously disturbed and planned for further conversion to accommodate projected growth in the RAA. As such, based on the Project in combination with past, present and certain and reasonably foreseeable future projects within the RAA, the conversion of agricultural land will result in cumulative residual environmental effects (*i.e.*, loss of agricultural land) that are predicted to be not significant.

When considered in the overall context of socio-economic conditions, a positive cumulative effect is predicted as a result of the Project in combination with past, present and reasonably foreseeable future projects. The Project will complement existing transportation infrastructure and improve economic opportunities for the GTHA and Canadian economy, while similar opportunities would be anticipated through development of the Boyne Planning District (see response to **IR5.2**), MEV and Derry Green Corporate Business Park.

## IR5.7 Migratory birds

**Rationale:** In subsection 6.6.1.2.6 of the EIS, CN stated that it did not expect the Project's contribution to cumulative effects on migratory birds to affect the sustainability of the migratory bird populations in the regional assessment area partly because direct mortality events are expected to be rare. CN stated that the cumulative effects of the Project would likely not affect the stability and long-term survival of migratory birds in the regional assessment area.

In response to the Canadian Environmental Assessment Agency's Additional Information Requirement #25 (CEAR #375), CN stated that cumulative mortality resulting from the Project, as well as future reasonably foreseeable projects in the regional assessment area, is not anticipated to contribute to a measurable decline of the migratory bird population.

In subsection 6.6.1.2.3 of the EIS, CN stated that the residential development of the Boyne Planning District is predicted to result in the loss of 934 hectares of terrestrial habitat, and the Project would result in the loss or alteration of approximately 54.6 hectares of terrestrial habitat.

CN stated that the loss of habitat may displace some migratory bird residences into habitat outside the project development area and the residential development footprint. CN stated that this displacement is anticipated to be low in magnitude based on the size of the areas to be altered in relation to the overall available habitat in the regional assessment area.

Figure 5 of Appendix E.16 to the EIS shows migratory bird habitat, but it is unclear how much migratory bird habitat exists within the regional assessment area, the suitability of that habitat, and its ability to accommodate any species or individuals that may be displaced as a result of the Project.

### Information Request:

- a) Provide additional information on the quantity of suitable migratory bird habitat that currently exists within the regional assessment area, and which would continue to exist after consideration of all reasonably foreseeable future projects and activities. Compare the amount of migratory bird habitat that would be affected by the Project to the amount of available migratory bird habitat in the regional assessment area.
- b) Provide evidence to support the conclusion that migratory bird populations would not measurably decline in the regional assessment area, as a result of Project-related construction or operations.
- c) Based on the findings in the EIS, estimate the Project-related migratory bird displacement and mortality. Compare the extent of Project-related migratory bird displacement and mortality to the existing population of migratory birds in the regional assessment area.

### CN Response:

- a) Provide additional information on the quantity of suitable migratory bird habitat that currently exists within the regional assessment area, and which would continue to exist after consideration of all reasonably foreseeable future projects and activities. Compare the amount of migratory bird habitat that would be affected by the Project to the amount of available migratory bird habitat in the regional assessment area.



The Terrestrial TDR (EIS, Appendix E.16) identified habitat for migratory birds in the PDA and LAA by dividing the habitat into three categories: woodland, wetland and grassland migratory bird habitat (EIS, Appendix E.16, Section 5.4). This response utilizes these same categories to quantify and compare migratory bird habitat in the RAA. A discussion on the selected past baseline and changes to migratory bird habitat and species are provided in response to **IR5.2**.

The response has been organized into three subsections to address each component of the information request.

### **Quantity of Suitable Migratory Bird Habitat in the RAA**

In response to this IR, a habitat assessment was undertaken to identify the three categories of habitat (woodland, wetland and grassland) in the RAA. The assessment began with a desktop review, including the background information from the Terrestrial TDR (EIS, Appendix E.16, Figure 1), such as LIO (2015) that mapped woodland and wetlands. This information was further refined using aerial photograph interpretation to delineate areas within the RAA that would likely be suitable for woodland, wetland and grassland migratory birds. A field investigation was undertaken on December 8, 2017 to ground truth the results of the desktop review, whereby lands within the RAA were assessed from the roadside to confirm the presence of woodlands and wetlands. Crop types in the RAA were also confirmed through roadside observations to identify areas of suitable grassland migratory bird habitat (*i.e.*, hay, pasture or meadow).

The results of the habitat assessment are presented in **Attachment IR5.7-1: Migratory Bird Habitat within the RAA**. In the RAA, 398.6 ha of suitable migratory bird habitat was identified (which includes habitat within the PDA), comprising:

- 55 ha of woodland habitat;
- 43.7 ha of wetland habitat; and,
- 299.9 ha of grassland habitat.

The woodland habitat is primarily deciduous forests, similar to those identified in the LAA. Wetland migratory bird habitat in the RAA is associated with marsh habitat along watercourses or open marsh habitat along woodland edges or in clearings. The marsh habitat along watercourses is similar to the wetland migratory bird habitat that occurs in the PDA. Open marsh habitat in woodland edges or clearings is similar to that found at the south end of the LAA. Grassland migratory bird habitat in the RAA is predominantly hay and pasture, with less meadow. The composition of grassland migratory bird habitat in the RAA was similar to that found in the PDA and LAA.

### **Quantity of Habitat that Would Continue to Exist after Consideration of all Reasonably Foreseeable Future Projects and Activities**

The assessment of cumulative effects is provided in EIS, Section 6.6.1.2, and in response to CEAA IR25 (CEAR #[375](#)). Reasonably foreseeable future projects and activities that may affect migratory bird habitat in the RAA include the Boyne Planning District, the Britannia Road Transportation Corridor Improvements, the Union Gas Hamilton-Milton project, and the Milton Education Village (as discussed in response to **IR5.3**). **Attachment IR5.7-1** depicts these reasonably foreseeable future projects, overlaid on migratory bird habitat in the RAA.

The Union Gas Hamilton-Milton project was constructed in 2016. While this was considered a “future” project at the time of the EIS, the project was completed at the time of the December 8, 2017 field investigation to map migratory bird habitat in the RAA. As such, the mapping in **Attachment IR5.7-1** accounts for changes to migratory bird habitat from the Union Gas Hamilton-Milton project.

The Britannia Road Transportation Corridor Improvements are to occur along existing roadways and not expected to result in changes to migratory bird habitat in the RAA.

It is assumed, during urban development in the Boyne Planning District, that woodlands and wetlands will be protected under the provincial *Planning Act*, as well as the Town of Milton OP and Halton Region OP policies, and that there will be no direct loss of these habitats. As such, the quantity of woodland and wetland migratory bird habitat in the RAA is not anticipated to be affected by development in the Boyne Planning District. However, grassland habitat in the Boyne Planning District, in the form of hay, pasture or meadow may be lost during urban development. Where species at risk occur (i.e., Bobolink or Eastern Meadowlark), the provincial *Endangered Species Act* would require developers of these lands to offset that loss of habitat through creation and maintenance of compensation habitat. However, such compensation habitat (by others) is likely to occur outside the RAA; therefore, CN assumes that grassland habitat occurring in the Boyne Planning District would be lost.

As stated in the response to **IR5.3**, there is no grassland habitat (or other migratory bird habitat) within the Milton Educational Village study area that overlaps with the RAA for this Project. As such, effects from the MEV on migratory birds are not anticipated to interact cumulatively with the effects from the Project.

With these considerations, it is predicted that 351.1 ha of suitable migratory bird habitat in the RAA would continue to exist after agricultural land conversion due to the Project and the reasonably foreseeable projects and activities. This habitat is:

- 55 ha of woodland habitat;
- 47.1 ha of wetland habitat; and,
- 249 ha of grassland habitat.

#### **Comparison of the Amount of Migratory Bird Habitat that Would Be Affected by the Project to the Amount of Available Migratory Bird Habitat in the RAA**

**Table IR5.7-1** lists the amount of migratory bird habitat that will be lost due to the Project and certain and reasonably foreseeable future projects within the RAA, the amount of habitat that will be gained due to habitat creation within the PDA (due to the Project) and the total amount of habitat predicted to be available to migratory birds in the RAA in the future.

**Table IR5.7-1 Comparison of Amount of Migratory Bird Habitat in the PDA and RAA**

	Areas of Migratory Bird Habitat (ha)					
	Existing habitat in RAA (including PDA)	Habitat lost in the PDA (by the Project)	Habitat created in the PDA (by CN)	Habitat lost in remainder of the RAA (i.e., affected by other reasonably foreseeable projects)	Predicted future habitat in RAA*	Predicted future habitat including offsite compensation by CN (% change)
Woodland	55	0	0	0	55	55 (0%)
Wetland	43.7	3.7	7.1	0	47.1	47.1 (+7.8%)
Grassland	299.9	50.9	0	0	249	289.7 (-3.4%)
<b>Total</b>	<b>398.6</b>	<b>54.6</b>	<b>7.1</b>	<b>0</b>	<b>351.1</b>	<b>391.8 (-1.7%)</b>

\*Note: Off-site compensation habitat to follow the Ministry of Natural Resources and Forestry (MNR) requirements to achieve a benefit to grassland birds.

Overall, no change in woodland migratory bird habitat in the RAA is anticipated. No net loss of wetland migratory bird habitat in the RAA is anticipated (EIS, Section 6.6.1.2.3), with CN commitments in the EIS for habitat creation and enhancements (EIS, Section 6.5.3.9.2). Through refinements of CN's proposed wildlife habitat compensation and enhancement plans provided in response to IR4.58, a net gain in wetland migratory bird habitat is anticipated.

A loss of grassland migratory bird habitat is expected to occur in the RAA as a result of the Project. However, the loss of grassland habitat within the PDA will be offset by CN through the creation and maintenance of grassland habitat outside the RAA (EIS, Section 6.5.2.9.2, with further information provided in response to IR4.56). The creation and maintenance of grassland habitat conforms to MNR's requirements, and is designed to achieve a benefit to the species. The offset habitat will be managed to prevent loss of habitat due to development pressure or natural succession into shrubland. Unlike the existing PDA grassland habitat, the offset habitat will not be subject to the agricultural activities (e.g., hay cutting), which are the most significant current threat to breeding success of grassland birds.

b) Provide evidence to support the conclusion that migratory bird populations would not measurably decline in the regional assessment area, as a result of Project-related construction or operations.

As mentioned in the response above, the Terrestrial TDR (EIS, Appendix E.16) identified habitat for migratory birds in the PDA and LAA by dividing the habitat into three categories: woodland, wetland and grassland migratory bird habitat (EIS, Appendix E.16, Section 5.4). This response is organized using these same categories.

### Woodland Migratory Birds

The Project is not anticipated to result in the loss of woodland habitat for migratory birds. As discussed in response to IR4.55, there is the potential for temporary displacement of woodland birds from the LAA during construction because of increased noise levels. However, it is anticipated to be short term in duration during the construction period. Furthermore, considering the small amount of woodland habitat in the LAA, any displacement is likely to occur to only a small number of individuals. The 55 ha of woodland habitat in the RAA has the potential to support



the temporarily displaced birds. As such, no measurable change to woodland migratory bird species populations is anticipated in the RAA.

### **Wetland Migratory Birds**

The Project will result in the loss of 3.7 ha of wetland habitat, which will be offset by the creation of 7.1 ha of wetland habitat in the PDA, for a net gain of 3.4 ha of wetland habitat. During the two-year construction period, there will be temporary displacement of wetland habitat that supports migratory birds. However, as discussed in the response to IR4.55, wetland habitat elsewhere in the RAA has the potential to support migratory birds temporarily displaced from the two small meadow marsh communities. Furthermore, displaced wetland migratory bird species are expected to be Red-winged Blackbird and Spotted Sandpiper; these two species are considered adaptable and readily breed in a wide variety of habitats in agricultural settings (fields, ditches, farm ponds). Therefore, no measurable change to wetland migratory bird species diversity or density is anticipated in the RAA during construction.

As discussed in the response to IR4.56, the creation of 7.1 ha of wetland habitat in the PDA is expected to support a greater number and variety of breeding wetland migratory birds than the existing wetlands.

Overall, an increase in the number and species diversity of wetland migratory birds is anticipated in the RAA.

### **Grassland Migratory Birds**

A loss of 50.9 ha of grassland migratory bird habitat is anticipated in the RAA, all of which is within the PDA. As compensation for the loss of grassland habitat in the PDA, CN commits (see EIS, Section 6.5.2.9.2) to the creation and maintenance of grassland habitat outside of the RAA. As discussed in the response to IR4.55, although the compensation habitat is to be created outside the RAA, it is expected to benefit the same populations of grassland birds that occur in the RAA.

Furthermore, when considering effects on local populations of grassland migratory birds, the existing agricultural conditions in the PDA and RAA should be considered, including agricultural practices that currently contribute to mortality of grassland migratory birds by the destruction of nests, eggs and nestlings during hay cutting. It is estimated that hay cutting results in 94% mortality of Bobolink nests (COSEWIC 2010). With the implementation of non-agricultural grassland habitat compensation by CN, a long-term positive effect to migratory grassland bird populations is anticipated, by avoiding the agricultural source (seasonal crop cutting) of mortality in the compensation habitat.

c) *Based on the findings in the EIS, estimate the Project-related migratory bird displacement and mortality. Compare the extent of Project-related migratory bird displacement and mortality to the existing population of migratory birds in the regional assessment area.*

### **Estimated Displacement**

Estimated displacement of migratory birds is discussed in the response to IR4.55. For woodland migratory birds, no measurable displacement from the RAA is anticipated as a result of construction and operation of the Project. For wetland migratory birds, a temporary displacement from the PDA will occur during construction; however, no measurable displacement is anticipated



from the RAA. Following construction, an increase in the number and species diversity of wetland migratory birds is anticipated as a result of habitat creation and enhancements by CN.

For grassland birds, 407 pairs of breeding birds are anticipated to be displaced by Project construction. As compensation, CN commits to the creation and maintenance of off-site grassland bird habitat (see EIS, Section 6.5.2.9.2), which will occur outside the RAA (see response to IR4.56).

### Estimated Mortality

A discussion of potential migratory bird mortality is provided in the response to IR4.55; anticipated mortality rates to migratory birds are too small to allow a quantitative estimate. However, details on each Project effect pathway were provided, to clarify the magnitude of predicted migratory bird fatalities. The response to IR4.55 made the following conclusions:

- Predicted bird mortality during construction is anticipated to be none to a small number of individual migratory birds.
- Bird mortality resulting from a spill is expected to be rare, if it were to occur at all. In the event it occurred, mortality could occur to a small number of individuals.
- Based on a literature review, mortality rates from collision with low-rise commercial buildings, such as the Project's administration building and maintenance garage, was estimated at 0.4 to 55 migratory bird mortalities per year. With mitigation in place, including best management practices to reduce risk of avian collision with windows, the migratory bird mortality resulting from the Project buildings is anticipated to be at the lower end of this range.

### Comparison of Displacement and Mortality to the Existing Population of Migratory Birds in the RAA

The existing population of migratory birds in the RAA is unknown. However, as discussed in response to part a) of this IR, the woodland, wetland and grassland habitat identified in the RAA is similar to that found in the LAA and PDA. Therefore, it is a reasonable assumption that the habitats in the RAA (shown in **Attachment IR5.7-1**) support a similar species diversity and density of migratory birds to the habitats identified in the PDA and LAA. Therefore, the point count data of migratory bird habitat in the PDA and LAA (EIS, Appendix E.16, Section 5.4) can be used as an indication of migratory bird species diversity and density in the RAA. **Table IR5.7-2** provides an estimate of the number of migratory birds in the RAA, compared to estimated displacement and mortality.

**Table IR5.7-2 Estimate of Migratory Bird Breeding Pairs in the RAA and Comparison to Estimated Displacement and Mortality in the PDA**

	Areas of Migratory Bird Habitat (ha)				Estimated mortality within the PDA
	Existing habitat in RAA (including PDA)	Breeding Bird Density (breeding pairs / ha)	Estimated number of breeding pairs in RAA	Estimated Displacement within the PDA	
Woodland	55	8.0 pairs / ha	440	0	n/a
Wetland	43.7	3.8 pairs / ha	166	-13*	n/a
Grassland	299.9	8.0 pairs / ha	2,399	407	n/a
<b>Total</b>	<b>398.6</b>		<b>3,005</b>	<b>394</b>	n/a

\*- minus 13 refers to 13 additional pairs from the additional wetland habitat proposed by CN in the PDA.



With regard to displacement, it should be noted that wetland habitat creation is anticipated to result in an increase of migratory birds in the RAA. The net gain of 3.4 ha of wetland habitat is expected to increase the number of migratory birds by 13 pairs (3.4 ha x 3.8 pairs/ha).

As discussed in the response to part b), while compensation grassland habitat will be created by CN outside the RAA, it is expected to benefit the same populations of grassland migratory birds that occur within the RAA. Therefore, the overall estimated displacement of 394 breeding pairs in the PDA is an overestimate of the displacement at a population level.

With regard to mortality, a quantitative estimate could not be provided because anticipated mortality rates for migratory birds are too small. However, considering each Project effects pathway, mortality is expected to occur to a small number of individuals and is not expected to result in a measurable change to the number of breeding pairs in the RAA. Furthermore, creation of the offsite grassland compensation habitat by CN will reduce mortality of migratory birds.

Grassland habitat in the PDA is currently subject to typical agricultural practices (e.g., hay cutting) that contribute to bird mortality. That source of mortality will not be present at CN's compensation grassland habitat, which will be managed for breeding birds. As stated above, the compensation habitat is anticipated to benefit the same population of grassland birds that occur in the RAA. It is anticipated the reduction in migratory bird mortality from CN's compensation habitat will more than offset any potential mortality in the PDA from construction and operation of the Project.

## **IR5.8 Species at Risk**

**Rationale:** *In subsection 6.6.1.3.5 of the EIS, CN stated that direct mortality events for species at risk are expected to be rare and would affect a negligible proportion of the species at risk population in the region. CN stated that displaced species at risk would still have access to suitable habitat elsewhere within the regional assessment area.*

*In response to the Canadian Environmental Assessment Agency's Additional Information Requirement #25 (CEAR #375), CN stated that direct species at risk mortality would possibly occur during construction phases for the Project through vegetation removal, site clearing, in-water works, or through vehicular or equipment strikes.*

*CN also stated that loss of critical habitat for species at risk was calculated to be approximately 44.4 hectares. Removing or altering this habitat may displace some species at risk into habitat elsewhere within the regional assessment area or outside the regional assessment area.*

*CN stated that the cumulative effects of the Project would not likely affect the stability and long-term survival of species at risk in the regional assessment area but did not provide supporting evidence.*

*Figure 5 of Appendix E.16 to the EIS shows species at risk habitat, but it is unclear how much species at risk habitat exists within the regional assessment area, the suitability of that habitat, and its ability to accommodate any species at risk that may be displaced as a result of the Project.*



**Information Request:**

- a) Provide additional information on the quantity of suitable species at risk habitat that exists within the regional assessment area. Compare the amount of species at risk habitat that would be affected by the Project to the amount of available species at risk habitat in the regional assessment area.
- b) Provide evidence to support the conclusion that the stability and long-term survival of species at risk populations would not likely be affected in the regional assessment area.
- c) Based on the findings in the EIS, estimate the Project-related species at risk mortality. Compare the extent of Project-related species at risk mortality to the existing population of species at risk in the regional assessment area.

**CN Response:**

- a) Provide additional information on the quantity of suitable species at risk habitat that exists within the regional assessment area. Compare the amount of species at risk habitat that would be affected by the Project to the amount of available species at risk habitat in the regional assessment area.

EIS, Section 6.5.3.7 identifies species at risk and/or their habitat that are in the PDA or LAA:

- Western Chorus Frog is designated as *threatened* under the federal *Species at Risk Act* (SARA) and *not at risk* under the *Endangered Species Act* (ESA). The species was not observed in the LAA or PDA, but there is critical habitat, as designated pursuant to SARA, in the LAA. There is no critical habitat for this species in the PDA.
- Snapping Turtle is designated as *special concern* under SARA and ESA. It was observed in the PDA and LAA.
- Eastern Wood-Pewee is designated as *special concern* under ESA and by COSEWIC (not yet on a SARA schedule). It was observed in the LAA, but not the PDA.
- Barn Swallow is designated as *threatened* under ESA. It was recently added to Schedule 1 of SARA (after the EIS was submitted). It was observed in the PDA and LAA.
- Bobolink is designated as *threatened* under ESA. It was recently added to Schedule 1 of SARA (after the EIS was submitted). It was observed in the PDA and LAA.
- Eastern Meadowlark is designated as *threatened* under ESA. It was recently added to Schedule 1 of SARA (after the EIS was submitted). It was observed in the PDA and LAA.
- Little Brown Myotis is designated as *endangered* under SARA and ESA. It was observed in the LAA, but not the PDA.

In addition to the above seven species, IR3.50 identified habitat for Monarch (provincially and federally special concern) within the PDA and LAA. The response to this IR will consider these eight species. A discussion on the selected past baseline and changes to species at risk and habitat that support these species are provided in response to **IR5.2**. The response has been divided into two subsections to address each component of the information request:



### Quantity of Suitable Species at Risk Habitat in the RAA

Potential suitable habitat for these eight species at risk that occurs in the RAA include:

- Western Chorus Frog - both wetlands (ponds, marshes, swamps) and terrestrial (meadows, shrublands) components;
- Snapping Turtle - wetlands that contain standing water;
- Eastern Wood-Pewee - deciduous and mixed woodland;
- Barn Swallow (breeding) - nesting structures (e.g., barns or culverts);
- Bobolink (breeding) - hay, pasture and meadow fields;
- Eastern Meadowlark (breeding) - hay, pasture and meadow fields;
- Little Brown Myotis (maternity roost) - deciduous and mixed woodland; and,
- Monarch - meadows and thickets.

In response to this IR, a habitat assessment was undertaken to identify the potentially suitable habitat for the eight species at risk in the RAA. The assessment began with a desktop review, including the background information from the Terrestrial TDR (EIS Appendix E.16, Figure 1), such as LIO (2015) that mapped woodland and wetlands. This information was further refined using aerial photograph interpretation to delineate areas of the RAA that would likely provide suitable habitat for each species at risk.

A field investigation was undertaken on December 8, 2017 to ground truth the results of the desktop review. Lands within the RAA were assessed from the roadside to confirm the presence of woodlands and wetlands. Crop types in the RAA were also confirmed in order to identify areas of suitable Bobolink and Eastern Meadowlark habitat (*i.e.*, hay, pasture or meadow). Bobolink and Eastern Meadowlark have more defined habitat requirements than some other grassland migratory birds; for example, Bobolink tend to avoid fields with succession of trees or shrubs. As such, the amount of migratory bird grassland habitat provided in the response to **IR5.7** is not necessarily consistent with the amount of Bobolink and Eastern Meadowlark habitat in the RAA.

Identification of potential nesting structures for Barn Swallow was not completed. Barn Swallows will use a variety of structures for nesting, such as barns or culverts. The number of potentially suitable nesting structures in the RAA were too numerous to assess and in many cases an assessment would not have been possible without access to non-CN property. Given the abundance of potential nesting structures, it is anticipated nesting opportunities for this species are widespread throughout the RAA.

The results of the habitat assessment are presented in **Attachment IR5.8-1: Species at Risk Habitat within the RAA**. The estimated amount of potential suitable habitat for each species at risk in the RAA (including the PDA) is:

- Western Chorus Frog, 69 ha
- Snapping Turtle, 42.7 ha



- Eastern Wood-Pewee, 40 ha
- Bobolink, 266.7 ha
- Eastern Meadowlark, 266.7 ha
- Barn Swallow, indeterminate (widespread)
- Little Brown Myotis, 40 ha
- Monarch, 66.8 ha

**Compare the Amount of Species at Risk Habitat that would be Affected by the Project to the Amount of Available Species at Risk Habitat in the RAA.**

In the rationale for the IR, it is stated that “loss of critical habitat for species at risk was calculated to be approximately 44.4 hectares.” However, this is incorrect. In fact, as discussed in EIS, Section 6.5.3.9.3, the Project is not anticipated to result in the loss of critical habitat for species at risk. Critical habitat under SARA is as defined in the recovery strategy of a listed wildlife species, which does not necessarily encompass all areas of suitable habitat for the species. As such, while there will be a loss of species at risk habitat in the PDA, this is not properly characterized as “critical” habitat.

**Table IR5.8-1** lists the amount of species at risk habitat that will be lost due to Project construction and the amount of habitat that will be gained, due to habitat creation in the PDA.

Furthermore, to facilitate the response to part b), other reasonably foreseeable future projects that may affect species at risk habitat in the RAA were considered. Consistent with the assessment of cumulative effects (EIS, Section 6.6.1.2) and supplemental information provided in response to CEAA IR25 (CEAR #375), certain and reasonably foreseeable future projects in the RAA include the Boyne Planning District, the Britannia Road Transportation Corridor Improvements and the Union Gas Hamilton-Milton Project. We have also included the MEV to remain consistent with the response to **IR5.3. Attachment IR5.8-1** depicts these certain and reasonably foreseeable future projects, overlaid on species at risk habitat in the RAA.

The Union Gas Hamilton-Milton project was constructed in 2016. While this was considered a “future” project at the time of the EIS, the project was completed at the time of the December 8, 2017 field investigation to map species at risk habitat in the RAA. As such, the mapping in **Attachment IR5.8-1** accounts for changes to species at risk habitat from the Union Gas Hamilton-Milton project.

Within the RAA, the Britannia Road Transportation Corridor Improvements will occur along existing roadways and is not expected to result in changes to the species at risk habitat in the RAA, with the exception of Barn Swallow, which was observed nesting in one of the culverts beneath Britannia Road within the RAA (*i.e.*, culvert crossing west of the woodland located to the east of First Line, south side of Britannia Road). It is assumed, during urban development in the Boyne Planning District, that woodlands and wetlands will be protected under the provincial *Planning Act* and that there will be no direct loss of these habitats. Therefore, development of the Boyne Planning District is not expected to change the amount of potential habitat for species at risk that use woodland and wetlands (Snapping Turtle, Eastern Wood-Pewee and Little Brown Myotis). Furthermore, potential Western Chorus Frog habitat has been identified in protected areas, such as wetlands, woodlands or ANSIs. Therefore, changes in the amount of potential habitat for this species in the RAA are not anticipated. However, Bobolink and Eastern Meadowlark habitat in the Boyne

Planning District, in the form of hay, pasture or meadow, may be lost during development. Where species at risk occur, the provincial ESA will require developers to offset that loss of habitat through creation and maintenance of compensation habitat. However, such compensation habitat (by others) is likely to occur outside the RAA; therefore, CN assumes that Bobolink and Eastern Meadowlark habitat occurring in the Boyne Planning District would be lost.

The MEV is proposed within agricultural fields that are in annual row crops (i.e., not hay or pasture) and do not provide suitable habitat for grassland species at risk, such as Bobolink or Eastern Meadowlark.

The amount of species at risk habitat that is assumed to be lost in the RAA (due to other reasonably foreseeable projects) and the predicted amount of species at risk habitat in the RAA after consideration of the Project and reasonably foreseeable future projects and activities is listed in **Table IR5.8-1**.

**Table IR5.8-1 Comparison of Amount of Species at Risk Habitat in the PDA and RAA**

Species at Risk	Existing Habitat in RAA (including PDA)	Areas of Species at Risk Habitat (ha)			
		Habitat Lost in PDA (affected by the Project)	Habitat Created in the PDA by CN	Habitat Lost in Remainder of RAA (Affected by other Reasonably Foreseeable Projects)	Predicted Future Habitat in RAA (% change)
Western Chorus Frog	69	0	0	0	69 (0%)
Snapping Turtle	42.7	3.7	7.1	0	46.1 (+7.75%)
Eastern Wood-Pewee	40	0	0	0	40 (0%)
Bobolink*	266.7	40.7	0	0	226 (-15.26%)
Eastern Meadowlark*	266.7	40.7	0	0	226 (-15.26%)
Barn Swallow**	Unknown**	0	0	Unknown**	Unknown**
Little Brown Myotis	40	0	0	0	40 (0%)
Monarch*	66.8	10.8	18.8	2	72.8 (+8.98%)

\* In addition, CN will be creating an additional 40.7 ha of grassland habitat for Bobolink, Eastern Meadowlark and Monarch outside of the RAA.

\*\* Unknown is listed in recognition that the number of suitable nesting structures are considered too numerous to identify.



No change in potential habitat in the RAA for Western Chorus Frog, Eastern Wood-Pewee or Little Brown Myotis is anticipated. A net gain in Snapping Turtle and Monarch habitat in the RAA is anticipated, due to commitments for on-site habitat creation and enhancements.

A loss of Bobolink and Eastern Meadowlark habitat is expected to occur in the RAA. However, the loss of habitat is expected to be more than offset by creation and maintenance of 40.7 ha of suitable habitat outside the RAA by CN (EIS, Section 6.5.2.9.2; and as discussed in response to IR4.56), which will serve the same populations. The creation and maintenance of Bobolink and Eastern Meadowlark habitat conforms to MNRF's requirements, and is designed to achieve a benefit to the species. The offset habitat will be managed to prevent loss of habitat due to development pressure or natural succession into shrubland. Unlike the existing PDA grassland habitat, the offset habitat will not be subject to the agricultural activities (e.g., hay cutting), which are the most significant current threat to breeding success of grassland birds.

The amount of Barn Swallow habitat in the RAA is not quantified because suitable nesting structures are too numerous to identify. In the PDA, a single Barn Swallow nesting structure was identified, which will not be removed by the Project (EIS, Section 6.5.3.9.3). One Barn Swallow structure was also observed in a culvert beneath Britannia Road, which will be replaced during the roadway improvements proposed by the Region. Potential loss of nesting structures due to other certain and reasonably foreseeable projects or activities in the RAA cannot be predicted. However, such nesting structures are protected under the provincial *Endangered Species Act*. Therefore, proponents of reasonably foreseeable projects in the RAA removing such habitat would be required to offset that loss through creation and maintenance of compensation habitat, which could occur within or outside the RAA.

b) *Provide evidence to support the conclusion that the stability and long-term survival of species at risk populations would not likely be affected in the regional assessment area.*

The discussion below considers changes to mortality and to habitat of species at risk from the Project, as well as change in habitat from other certain and reasonably foreseeable future projects and activities in the RAA.

#### *Western Chorus Frog*

This species was not observed in the PDA or LAA; however, it may occur in the RAA. No loss of Western Chorus Frog habitat is anticipated in the RAA from the Project or other reasonably foreseeable future projects. As concluded in EIS, Section 6.5.3.9.3 and in response to CEAA IR19 (CEAR #72 and #375), with noise mitigation in place, disturbance from operation of the facility is not anticipated in adjacent habitats. Furthermore, as concluded in the response to part c) of this IR, no mortality to the species is anticipated from the Project. As such, the Project is not anticipated to affect the stability or long-term survival of Western Chorus Frog in the RAA.

#### *Snapping Turtle*

Through the habitat creation and enhancement measures associated with the realignment of Indian Creek and Tributary A, Snapping Turtle habitat in the RAA is anticipated to increase from 42.7 ha to 46.1 ha (see **Table IR5.8-1**). Habitat creation and enhancement also includes creation of nesting habitat, which has the potential to improve breeding success and the stability of the local population of Snapping Turtles.

As concluded in the response to part c) of this IR, with mitigation in place, no Snapping Turtle mortality is likely to occur from Project construction and operations. Overall, the Project is therefore not anticipated to negatively affect the stability or long-term survival of Snapping Turtle in the RAA.

#### *Eastern Wood-Pewee*

As discussed in the response to part a) of this IR, no loss of Eastern Wood-Pewee habitat is anticipated from Project construction and operations, nor is any change in habitat anticipated from other reasonably foreseeable future projects in the RAA. As concluded in EIS, Section 6.5.3.9.3 and in response to IR19 (CEAR #[72](#) and #[375](#)), with noise mitigation in place, sensory disturbance from operations is not anticipated in adjacent habitats. As concluded in the response to part c) of this IR, no Project-related Eastern Wood-Pewee mortality is anticipated; the Project is therefore not anticipated to affect the stability or long-term survival of Eastern Wood-Pewee in the RAA.

#### *Bobolink and Eastern Meadowlark*

A loss of Bobolink and Eastern Meadowlark habitat is expected to occur in the RAA during the Project construction phase and from activities related to other reasonably foreseeable future projects, as discussed in the response to part a) of this IR. However, the loss of habitat is expected to be more than offset by creation and maintenance of suitable habitat outside the RAA by CN and other project owners. As discussed in the response to IR4.55, although compensation habitat is to be created outside the RAA, it is expected to benefit the same populations of Bobolink and Eastern Meadowlark that occur within the RAA. Furthermore, as concluded in the response to part c) of this IR, no Project-related Bobolink or Eastern Meadowlark mortality is anticipated.

Through the management of the compensation habitat, which avoids the existing source of mortality from agriculture (*i.e.*, standard hay cutting), the Project is anticipated to positively affect the stability or long-term survival of the populations of Bobolink and Eastern Meadowlark which encompass the RAA.

#### *Barn Swallow*

As discussed in the response to part a), no loss of Barn Swallow habitat is anticipated from Project construction and operation. As noted in response to IR19 (CEAR #[72](#) and [375](#)), with noise mitigation in place, displacement of breeding Barn Swallows during Project construction and operation is not anticipated. As concluded in the response to part c), no Project-related Barn Swallow mortality is anticipated. Therefore, the Project is not anticipated to affect the stability or long-term survival of Barn Swallow in the RAA.

#### *Little Brown Myotis*

As discussed in the response to part a), no loss of Little Brown Myotis habitat is anticipated from Project construction and operation, nor is any change in habitat anticipated from other reasonably foreseeable future projects in the RAA. As concluded in the response to part c), no Project-related Little Brown Myotis mortality is anticipated. Therefore, the Project is not anticipated to affect the stability or long-term survival of Little Brown Myotis in the RAA.



### Monarch

Through the habitat creation and enhancement measures proposed by CN within the PDA, Monarch habitat within the RAA is anticipated to increase from 66.8 ha to 72.8 ha, as discussed in the response to part a). Further to the increase in the size of habitat, the enhancement habitat will also increase the number of milkweed plants present in the PDA and, therefore, increase the reproduction opportunities for Monarch. Monarchs are also expected to benefit from incorporation of milkweed and nectaring plants in the design of the 40.7 ha grassland bird offset habitat.

As concluded in the response to part c), Project-related mortality to Monarch is anticipated to be a few individuals during construction and operations. However, the increase in reproduction opportunities from the enhancement of habitat is anticipated to more than off-set mortality of a few individuals. Therefore, the Project is anticipated to positively affect the stability or long-term survival of the population of Monarch in the RAA.

c) *Based on the findings in the EIS, estimate the Project-related species at risk mortality. Compare the extent of Project-related species at risk mortality to the existing population of species at risk in the regional assessment area.*

### Western Chorus Frog

Based on pre-construction surveys and background review, there is no evidence of Western Chorus Frog in the LAA; therefore, no mortality to the species is anticipated due to the Project (EIS, Section 6.5.3.9.2).

### Snapping Turtle

With mitigation in place, the risk of Snapping Turtle mortality during Project construction and operation is anticipated to be very low to negligible (EIS, Section 6.5.3.9.2). Considering the low risk to Snapping Turtle, Project-related mortality to the species is unlikely.

As presented in response to IR1.4 (CEAR #561), pre-construction field studies observed eight Snapping Turtles in 2015 and seven in 2017 within the LAA and a small portion of the RAA (ponds to the south of the LAA). The number of individuals observed does not necessarily reflect an accurate estimate of the population size, but it does indicate an order of magnitude. The amount of suitable Snapping Turtle habitat in the RAA is approximately 10 times greater than the area covered in the pre-construction surveys, so the RAA could support several times more Snapping Turtles. Project-related mortality is unlikely to occur to this population.

### *Bird Species at Risk (Eastern Wood-Pewee, Bobolink, Eastern Meadowlark and Barn Swallow)*

It is expected that birds will avoid vehicular traffic in the area, and changes in mortality of bird SAR in the LAA are expected to be negligible (EIS, Section 6.5.3.9.2).

Pre-construction point count surveys (EIS, Appendix E.16, Section 5.4, Table 5.7) estimated breeding density of birds (including species at risk) in the LAA. Assuming similar density of breeding birds in other suitable habitats in the RAA and using the estimate of habitat in the RAA from the response to part a), the population of breeding birds in the RAA can be estimated (see **Table IR5.8-2**). The population at the end of the breeding season would be larger, considering the addition of young of the year.



**Table IR5.8-2 Estimate of the Number of Breeding Adult Bird Species at Risk in the RAA**

<b>Species</b>	<b>Breeding Density<sup>1</sup> (Number of Breeding Adults Per 10 Ha)</b>	<b>Existing Habitat in RAA (Ha)<sup>2</sup></b>	<b>Estimated Number of Breeding Adults in the RAA</b>
Eastern Wood- Pewee	9.6	40	38
Bobolink	20.8	226	470
Eastern Meadowlark	6.8	226	154

1 - breeding density as measured by pre-construction surveys (EIS, Appendix E.16, Section 5.4, Table 5.7)

2 - Amount of habitat in RAA as determined in the response to part a)

Barn Swallows rely on nesting structures; therefore, the population in the RAA cannot be estimated by extrapolating the amount of suitable habitat, as with the other bird species at risk. Pre-construction survey observed 12 breeding pairs in the LAA between two nesting structures (a barn and a culvert). It is anticipated that nesting opportunities for this species are widespread throughout the RAA and, therefore, the population is likely several times that in the LAA.

A quantitative estimate could not be provided because anticipated mortality rates for migratory birds are too small. However, considering each Project effects pathway, if any mortality occurred, it is expected to be a very small number of individuals and is not expected to result in a measurable change to the number of breeding pairs in the RAA. Furthermore, creation of the offsite grassland compensation habitat by CN will result in a net addition to the populations of Bobolink and Eastern Meadowlark, by following MNRF's requirements, and is designed to achieve a benefit to the species. Bobolink and Eastern Meadowlark habitat in the PDA is subject to agricultural practices (e.g., hay cutting) that contribute to bird mortality. That source of mortality will not be present at CN's compensation habitat, which will be managed for breeding birds. As stated above, the compensation habitat is anticipated to benefit the same populations of Bobolink and Eastern Meadowlark that occur in the RAA.

#### *Little Brown Myotis*

No Project-related mortality to Little Brown Myotis at risk is anticipated (EIS, Section 6.5.3.9.2).

#### *Monarch*

Project-related mortality to Monarch is anticipated to be from zero to a few individuals during Project construction and operations (see response to IR3.50).

The population of Monarchs in the RAA is unknown and anticipated to vary from year to year. Furthermore, provincial population estimates are not available. The latest provincial status assessment (COSSARO 2009) did not provide a population estimate. The recent federal status assessment (COSEWIC 2016) states; "Population size estimates are not available for Monarchs in Canada. Each fall hundreds of thousands of Monarchs migrate through Long Point in southern Ontario but it's unknown what proportion of the Canadian population these individuals represent."



Regardless, the small number of potential Project-related mortality to Monarch is anticipated to make up a very small proportion of a local population.

#### **IR5.9 Fish and fish habitat**

**Rationale:** *In subsection 6.5.1.4 of the EIS, CN identified four potential Project-induced changes that could affect fish and fish habitat: change in fish habitat; change in fish movement, migration and fish passage; change in fish mortality; and change in water quality. Of the four effects, CN determined that residual adverse environmental effects from the Project on fish and fish habitat would be limited to a change in fish mortality. CN only considered changes in fish mortality in its cumulative effects assessment for fish and fish habitat. If residual environmental effects are predicted for fish and habitat, regardless of the pathway of the effect, then fish and fish habitat should be carried forward to a cumulative effects assessment. The cumulative effects assessment for fish and fish habitat should therefore consider all pathways and all potential effects from physical activities that have been or will be carried out on the valued component, fish and fish habitat.*

#### **Information Request:**

- a) *Conduct a cumulative effects assessment for fish and fish habitat that is not limited to CRA fisheries and that also considers the cumulative effects to fish and fish habitat from all pathways, in addition to direct fish mortality.*

#### **CN Response:**

A CEA for fish and fish habitat was completed in the EIS, Section 6.6.1.1, with supplemental clarification in response to IR25 CEAR #375. While the productivity and sustainability of a Commercial, Recreational or Aboriginal (CRA) fishery has been used to determine the threshold for significance on fish and fish habitat for both residual effects and cumulative effects, the CEA was completed on all potential fish and fish habitat effects from the Project cumulatively, in combination with the past, present and certain and reasonably foreseeable future projects in the RAA (EIS Section 6.5.1.9). A discussion on the selected past baseline and changes to fish and fish habitat are provided in response to **IR5.2**.

The response to IR4.45 provided clarification on the classification of habitat in Tributary A between Britannia Road and First Line, such that it does not support fish that are part of or support a CRA fishery. The *Fisheries Act* (section 2(1)) defines fish habitat as: "spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes." Therefore, the reach of Tributary A between Britannia Road and First Line does meet the definition of fish habitat for its primary function of conveying water and nutrients to downstream reaches that provide direct habitat (*i.e.*, occupied by fish). Although the upper reaches of Tributary A meet the definition of fish habitat in the *Fisheries Act* by indirectly supporting fish (e.g., through flow and nutrient conveyance), effects from the Project are limited to reducing access by fish to the upper reaches of the tributary, which is already compromised by seasonal limitations on flow availability and duration of flow. These limitations will continue following construction of the Project.

The assessment of cumulative environmental effects on fish and fish habitat was carried out with respect to any Project-related adverse residual environmental effect(s) considered likely to interact cumulatively with the residual environmental effect of another past, present or certain and reasonably foreseeable future project or physical activity within the RAA. This was completed based on the approach described in the Agency's Operational Policy Statement *Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 (March 2015)* and the *Cumulative Effects Assessment Practitioners' Guide, 1999* (and more recently updated Interim Technical Guidance entitled "*Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*" released in March 2018). Based on the assessment of fish and fish habitat, adverse residual effects from the Project were limited to a change of fish mortality during the construction phase of the Project. Additional potential effects that were evaluated in the environmental effects assessment for fish and fish habitat included a change in fish habitat, change in fish movement, migration and fish passage and change in water quality (EIS Section 6.5.1). Through this assessment, a change in fish habitat and change in fish movement, migration and fish passage were evaluated as neutral and a change in water quality was evaluated as positive; all resulting from the mitigation measures proposed in the realignment of Indian Creek, removal of the on-line agricultural pond on Tributary A and offsetting measures planned and discussed in the response to IR4.49.

The response to **IR5.2** provides additional detail on Selected Past Baseline to present current conditions related to fish and fish habitat, a description of present residual effects, future conditions and an assessment of overall cumulative effects. In addition to information provided there, the response to **IR5.3** has identified two additional certain and reasonably foreseeable future projects or physical activities since the original submission of the EIS in December 2015. These are the MEV and the Derry Green Corporate Business Park. The addition of the MEV to the CEA on fish and fish habitat has been completed in response to **IR5.3 (a)**. The Derry Green Corporate Business Park is located outside of the RAA for fish and fish habitat (*i.e.*, occurs in a separate watershed than the Project) (see **Attachment IR5.3-2**) and therefore any residual effects that may occur as a result of the Derry Green Corporate Business Park would not act cumulatively with the residual effects from the Project (*i.e.*, does not contribute to the potential for cumulative effects on fish and fish habitat with the Project).

Cumulative effects from all pathways that could contribute to fish mortality included in the CEA were direct mortality due to in-water construction or by the introduction of deleterious material (*i.e.*, sediment) within Indian Creek and tributaries to Indian Creek within the RAA. Indirect pathways included water quality, change in riparian and in-water habitat availability (including critical habitat of SAR), and change in flow rates or obstructions. While these indirect pathways were determined to be neutral or positive based on the Project, the resulting residual effects based on past, present and certain and reasonably foreseeable future projects and physical activities in combination of the Project has the potential to interact cumulatively on fish and fish habitat. All future projects developed in the RAA will be required to protect and minimize potential effects on fish and fish habitat in accordance with applicable regulatory requirements. Development within the Boyne Survey Secondary Plan Area identifies protection of the upper reaches of Tributary A, implementation of erosion and sediment control measures and provision of stormwater management (SWM) for water quality control. Similar protection measures are proposed for the future widening of Britannia Road and anticipated during construction of the Union Gas project. Culvert replacements along Britannia Road are subject to similar mitigation measures and timing windows as those proposed for the CN Project. These measures avoid in-water work at times when fish are most sensitive (*i.e.*, reproduction), will preserve fish habitat, will maintain water flows and will minimize potential introduction of deleterious substances into waters frequented by fish.



CN's proposed naturalization of Indian Creek and portions of Tributary A (including removal of the on-line pond, as recommended by in the Bronte Creek Watershed Study (CH, 2002)) would have a positive effect on the fish habitat and quality of the water in Indian Creek and would therefore contribute to the protection of fish. Future physical activities, as defined above, in response to **IR5.3** and in the EIS (Section 6.6.1.1.1, Table 6.43) within the RAA would be expected to follow the guidance provided in the Bronte Creek Watershed Study (2002), Boyne Survey Secondary Plan (Town of Milton 2015) and associated compensation plans (AMEC 2013), and therefore are not expected to increase mortality risk, thus decreasing fish vulnerability through any pathways of effects on fish and fish habitat.

As stated above, the productivity and sustainability of a CRA fishery was used to determine whether the residual effects of the Project on fish mortality, in combination with the past, present and certain and reasonably foreseeable future projects in the RAA, will result in cumulative effects. Indian Creek and portions of Tributary A were determined to support fish habitat, both associated with a CRA fishery and under the definition of fish habitat under the *Fisheries Act*, within the PDA. As the past, present and certain and reasonably foreseeable future projects overlap either one or both of these watercourses in the RAA, the productivity and sustainability of fish and fish habitat would also be an appropriate marker for cumulative effects. Based on current conditions of the Indian Creek and tributaries in the RAA, as described in the Fish and Fish Habitat TDR (EIS Appendix E.4), the short-term duration of expected project-activity interactions for all future projects (including the Project, see EIS Section 6.6.1.1.3, Table 6.44), and through the implementation of mitigation measures, best management practices and RAPs, total cumulative effects from the Project in combination with past, present and reasonably foreseeable future projects would not reduce the productivity or sustainability of fish habitat within Indian Creek or its tributaries and are assessed to be not significant. The cumulative effects of past, present and certain and reasonably foreseeable future projects, as well as the Project's contribution to cumulative effects, are not anticipated to cause serious harm to fish in consideration of implementation of the proposed mitigation measures and habitat offsets.

## **IR5.10 Archaeological and heritage resources**

**Rationale:** *The Review Panel, in its information request 4.32 (Stage 3 and 4 archaeological assessments), requested that CN provide an updated assessment of the effects to archaeological resources and cultural heritage using the results of the Stage 3 and 4 archeological assessments for the Project. Information Request 4.37 (Effects on Indigenous cultural heritage) also requested that CN broaden the assessment to consider effects to Indigenous cultural heritage.*

### **Information Request:**

- a) *In consideration of these two information requests, indicate whether the Project would result in residual effects to archaeological resources and cultural heritage. If so, conduct a cumulative effects assessment for archaeological resources and cultural heritage.*

**CN Response:****Clarification:**

In the absence of federal legislation, the archaeological work completed for the Project was conducted in accordance with the Ministry of Tourism, Culture and Sport's (MTCS) 2011 *Standards and Guidelines for Consultant Archaeologists*. To address archaeological considerations as part of the land use planning and development process, these standards are set by the MTCS as a condition of a license to conduct archaeological fieldwork in Ontario. The objective of a Stage 3 archaeological assessment is to assess the cultural heritage value or interest (CHVI) of a site through controlled collection of material. A Stage 3 archaeological assessment also establishes the extent of an archaeological site, determines the characteristics of the archaeological resources/artifacts, and collects a representative sample of the archaeological artifacts. This information is used to support the determination of whether the site has been sufficiently documented or if further measures are required to protect or document the site fully.

When an archaeological site has been determined to retain further CHVI after Stage 3 archaeological assessment, a Stage 4 archaeological assessment is required to address and mitigate development impacts to the archaeological site either through avoidance and protection strategies or excavation. Completing Stage 4 mitigation of development impacts will address archaeological concerns under land use planning and development processes.

Stage 4 avoidance and protection strategies for archaeological sites is the preferred approach by the MTCS and must include measures to protect the archaeological site from impacts during project construction and subsequent operations. Further, protection measures must be long-term and robust. Long-term protection measures must ensure that archaeological concerns for the site are addressed for any further land use changes.

When avoidance and long-term protection strategies are not feasible or viable for a project, archaeological concerns for a site can be addressed and mitigated by excavation. Stage 4 mitigation of development impacts to an archaeological site through excavation are designed to:

- document the archaeological context, cultural features, and artifacts from the site;
- document the controlled removal of the archaeological site; and,
- preserve the information recovered for future study.

As explained further below, it was determined by the CN Project team, in discussion with participating Aboriginal groups, that the Stage 4 mitigation of 13 archaeological sites be completed by excavation because mitigation through avoidance and long-term protection of these sites was not a feasible or viable option for the Project. The recommendation to proceed with Stage 4 mitigation by excavation was included as part of each applicable Stage 3 archaeological assessment report recommendations and reviewed by participating Aboriginal communities. The recommendations to proceed with mitigation by excavation were also deemed compliant by the MTCS during their review of each applicable report.

**Response:**

During the Stage 3 archaeological assessments for the Project, the CHVI of each archaeological site was determined in accordance with Section 3.4 of the MTCS' 2011 *Standards and Guidelines for Consultant Archaeologists*. Determination of CHVI was further aided by input from participating Aboriginal communities (see responses to IR4.32 and IR4.37). Additionally, representatives from the participating Aboriginal communities participated in the Stage 3 archaeological field work for the Project (see response to IR4.37).

The CHVI of each Stage 3 archaeological location was determined through the following three processes:

- in the field with participating representatives;
- through the archaeological assessment report review process (as explained in the response to IR4.37); and,
- evaluating the archaeological resources against the MTCS' criteria.

From this, the Stage 3 archaeological assessments determined that 13 archaeological locations retained CHVI, and mitigation of effects (*i.e.*, development impacts as defined by the MTCS) to the archaeological site (*i.e.*, Stage 4) would be required.

The 13 archaeological locations subject to Stage 4 mitigation by excavation included 10 Aboriginal sites and three 19<sup>th</sup> century Euro-Canadian sites. The Stage 4 field work began on May 2, 2017 and was completed on November 8, 2017. During the Stage 4 mitigation, representatives from the participating Aboriginal communities were in the field with Stantec archaeologists. The Stage 4 field work and archaeological reports prepared for each site have documented the CHVI of each site and the information will be available for future research in perpetuity. Once the MTCS has reviewed each Stage 4 archaeological report and deemed them compliant with MTCS standards, the CHVI of each site will have been documented and the mitigation for each site deemed compliant with the conditions of archaeological licenses issued under the *Ontario Heritage Act*.

The MTCS' process of mitigating development impacts to an archaeological site is consistent with the CEAA's *Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archeological, Paleontological or Architectural Significance under the Canadian Environmental Assessment Act, 2012* (CEAA 2015). CEAA (2015) identifies that the mitigation of environmental effects includes the elimination, reduction or control of a designated project's environmental effects (e.g., avoidance and protection of an archaeological site), or, when this is not possible, restitution for any damage to the environment caused by the environmental effect. CEAA (2015) notes that mitigating effects on heritage or any structure, site or thing, may include "[C]onducting professional rescue archaeology, also known as preservation of record, to salvage archaeological resources (in part or entirely) and their contextual information prior to undertaking physical activities associated with the designated project". This mitigation measure is consistent with the MTCS' mitigation of development impacts through excavation.

CHVI has been tested, confirmed, and established for the identified archaeological sites within the PDA. The effects of the Project on the identified archaeological sites have been mitigated through archaeological excavation, documentation, and preservation/reporting. Stage 3 assessment and Stage 4 archaeological excavation have been completed in advance of any physical construction activities associated with the Project to mitigate potential effects on these identified resources. The response to IR4.32 highlights the possibility of incurring impacts on archaeological resources during the construction phase of the Project, and outlines proposed mitigation measures to account for this (as outlined in the EIS Section 6.5.6.9.2).

The information obtained from the archaeological work will be made available through archaeological assessment and mitigation reports following review by the MTCS and acceptance into the *Ontario Public Register of Archaeological Reports*. Copies of each report will also be provided directly to participating Aboriginal communities. For archaeological sites with distinct Aboriginal heritage, CN and Stantec are working with the participating Aboriginal communities to identify each archaeological site with a place name (see Attachment IR4.37-1, in response to IR4.37). Currently, the archaeological sites are identified with numerical designations (*i.e.*, Location 1, Location 2, etc.), which do not provide archaeological or heritage context. Rather, they simply ascribe the general order in which the archaeological resource was identified during the Stage 2 survey of the PDA. Ascribing place names provided by participating Aboriginal communities provides an opportunity to commemorate the archaeological site and their contributions to the CHVI of the site. Once determined, the place name will be registered with the MTCS' *Archaeological Sites Database*.

As described in the response to IR4.37, correspondence and dialogue pertaining to Aboriginal archaeological resources occurred throughout the archaeological field work for the Project with the Aboriginal communities participating in the Project. While the MNCFN noted salvage excavations, if required, would lead to adverse, low-to-moderate, and irreversible effects (CEAR #446), it was later determined by the CN team – in discussion with MNCFN and other participating Aboriginal groups – that the Stage 4 mitigation for the 13 sites retaining CHVI after Stage 3 AA should be completed by excavation because mitigation through avoidance and long-term protection was not a feasible or viable option for these sites. This conclusion was deemed compliant by the MTCS during their review of each applicable Stage 3 report.

Based on the results of Stage 3 AA and Stage 4 mitigation, and through the implementation of proposed mitigation measures, no residual adverse environmental effects of the Project on archaeological or heritage resources are expected. As stated in response to IR4.32, the archaeological assessment has led to the accumulation of new archaeological data (new knowledge), and an increased understanding of the past human use of the PDA, LAA and RAA, (which could be considered positive), and is consistent with the findings of the EIS (Section 6.5.6.9). Therefore, a cumulative effects assessment is not required.

Regarding the Panel's request in **IR5.2(a)** to "Ensure that responses to all other information requests asking for a cumulative effects assessment reflect this directive", the response above is unchanged in consideration of **IR5.2** given that the Project has no residual effects on archaeological and cultural heritage resources.

## FOLLOW-UP PROGRAMS

### IR5.11 Follow-up programs

**Rationale:** In Section 9.4 of the EIS, CN proposed follow-up programs for areas where scientific uncertainty exists in the prediction of effects: air quality, acoustic environment, surface water, fish and fish habitat, migratory birds and their habitat, socio-economic conditions, Aboriginal peoples, community services and infrastructure, land and resource use, heritage resources and archaeological resources.

CN provided a rationale for why it did not propose follow-up programs for groundwater, species at risk and economy and employment. However, no rationale was provided to explain why follow-up programs were not proposed for light, vegetation and soils, wildlife and wildlife habitat, human health, effects of the environment on the project, accidents and malfunctions, waste management and truck traffic.

#### Information Request:

- a) Explain why CN did not propose follow-up programs for light, vegetation and soils, wildlife and wildlife habitat, human health, effects of the environment on the project, accidents and malfunctions, waste management and truck traffic. Provide information to support CN's determination that scientific uncertainty did not exist for these areas.

#### CN Response:

As described in the EIS Section 9.0, follow-up programs under the CEAA, 2012 are designed to verify the accuracy of predicted effects and to determine the effectiveness of proposed mitigation measures taken to eliminate, reduce or control the adverse environmental effects of a designated project. As noted in EIS Section 9.4, and consistent with the EIS Guidelines, follow-up programs are proposed for areas where scientific uncertainty exists in the prediction of effects and the effectiveness of mitigation measures. Where certainty in the predicted effects or effectiveness of proposed mitigation measures was considered high (i.e., proven best management practices, tried and true methodologies), no follow-up programs were proposed.

CN did not propose follow-up programs for light, vegetation and soils, wildlife and wildlife habitat, human health, effects of the environment on the project, accidents and malfunctions, waste management and truck traffic. This determination was based on the results of the analysis of each discipline, level of certainty in the evaluation of potential effects and/or the confidence in the effectiveness of proposed mitigation measures, as further discussed below.

#### Light

CN did not propose a follow-up or monitoring program for light in the EIS. This is based on the quality of the effects prediction, which relies on the measurements and modelling of light effects at night, and/or the effectiveness of mitigation measures, which results in a low level of uncertainty. Night lighting at receptors near the Project (i.e., resulting from light spill / trespass) will be a maximum of 15% of the Commission Internationale de L'Eclairage (CIE) E3 environmental zone allowable (2 lux) light spill guideline based on Project lighting (Light TDR, EIS Appendix E.8, Table 5.2). Most receptors will experience light spill or trespass of 5% or less of the E3 allowable



trespass value of 2 lux. Further, as provided in the EIS and updated in response to IR4.5, the lighting design for the Project is being carried out in accordance with IES (Illuminating Engineering Society) and IDA (International Dark Sky Association) recommended practices in order to ensure an efficient, environmentally conscious result.

Additionally, the design makes use of recent innovations such as using modelling (AGi32 software prediction of illumination) and latest design luminaire hardware fixtures that will provide efficient operation. The sky quality measurements taken initially in 2014 and updated in 2018 are consistent with an area that corresponds to a sky quality typical of an urban environment. A continued decrease in sky quality (*i.e.*, increase in sky glow or night sky brightness) is predicted in the future as a result of continued urbanization of the area (including effects from the Project); however, this decreased sky quality (*i.e.*, increased night sky brightness) is predicted to be small (*i.e.*, where the typical number of stars visible in the hemisphere to the casual star gazer is not expected to deviate from the nominal 500 stars visible at present with the required good viewing conditions (weather, cloud cover, shaded viewing location)).

While follow-up or monitoring to confirm light effects are not proposed in the EIS, additional site observations / measurements will be conducted at the time of installing the light standards by the contractor (under the direction of CN) to ensure that the lighting of the Terminal is properly installed, adjusted and commissioned to minimize light spill.

### **Vegetation and Soils**

A follow-up program specific to vegetation and soils is not proposed, but the implementation of mitigation measures that pertain to vegetation and soils will be monitored through other follow-up programs as described below.

The realignment of Indian Creek will include re-establishment of vegetation as described in EIS, Section 9.4.5. The monitoring program to be developed in consultation with Fisheries and Oceans Canada (DFO) (as part of the *Fisheries Act* authorization) will include monitoring of vegetation to ensure the habitat is functioning as intended.

In addition, an Environmental Management Plan (EMP) will be developed and refined during detailed design. The EMP will include:

- Environmental Protection Plan (EPP);
- Emergency Response Plan (ERP);
- Soil Management Plan;
- Stormwater Management Plan;
- Erosion and Sedimentation Control (ESC) Plan; and,
- Planting Plan.

Each of these plans is described in Table 9.2, EIS Section 9.8. Measures pertaining to soils will be included in the EPP, ESC Plan and Soil Management Plan. Measures pertaining to vegetation protection and management will be included in the EPP and the Planting Plan will include prescribed lists of vegetation to be planted and seeded and locations within the Terminal for the re-establishment or reclamation of vegetation.

The implementation and effectiveness of these best management and standard measures will be overseen by a qualified Environmental Monitor, as described in the EIS Section 9.8. An environmental monitoring report produced during construction to document on-site processes and procedures will include:

- general construction activities;
- regular assessment of mitigation measures; and,
- verification of compliance with environmental requirements.

For further descriptions of construction monitoring and compliance monitoring programs, see the EIS, Section 9.5.1, and response to **IR5.12**. Further details regarding the timing, location, and methods for monitoring will be outlined in the Project-specific EPP to be developed during detailed design.

#### **Wildlife and Wildlife Habitat**

CN is working with Ducks Unlimited in relation to the creation, securement and long-term management of grassland habitat for Bobolink, Eastern Meadowlark and Monarch potentially affected by the Project (EIS Section 9.4.6). A description of the compensation habitat creation and management activities is provided in the response to IR4.56 (CEAR #[632](#)). Monitoring of the proposed habitat offset area will be conducted by Ducks Unlimited to assess establishment success and effectiveness (*i.e.*, bird use) of the grassland habitat offsets. Ducks Unlimited will provide CN with a yearly report outlining the status of the compensatory habitat.

There is little to no uncertainty in the amount of habitat that will be directly lost. Indirect effects (disturbance) are expected to be minimal with mitigation in place (*i.e.*, management plans incorporation of best management practices and standard construction mitigation, and adhering to restricted activity periods (e.g., vegetation removal before nesting periods)). Habitat in the LAA is agricultural, not pristine and already experiences disturbance. Considering the current disturbed nature of the LAA, there is a high level of confidence that additional disturbance from the Project will be not significant. As such, no follow-up program is warranted to confirm the effect prediction.

The effectiveness of wetland migratory bird and additional Monarch habitat offsets (as described in the response to IR4.56) and Snapping Turtle habitat offsets (as described in the response to IR4.58, CEAR #[632](#)) will be evaluated as part of the Indian Creek realignment monitoring, as described in EIS, Section 9.4.5. This monitoring program to be developed in consultation with DFO (as part of the *Fisheries Act* authorization) will also include monitoring of the riparian vegetation to ensure the habitat is functioning as intended.



No follow-up program is proposed for migratory birds or SAR, based on the proposed mitigation that will be in place for the Project specific to bird mortality. There is a potential for residual effects on migratory birds and SAR. However, given the proven effectiveness of mitigation, (*i.e.*, timing windows (restricted activity periods) as per standards set out by (Environment and Climate Change Canada) ECCC and MNRF, removal of vegetation and limiting movement of vehicles to planned areas within the PDA), the risk of bird mortality during site preparation is greatly reduced or removed (Longcore and Smith 2013). Further, while window strikes and vehicular collisions could occur, these are expected to be a low number of individuals. Mortality from these sources is well understood and confidently predicted to be a low order of magnitude. As such, no follow-up program is therefore required to confirm the effect prediction or the effectiveness of the mitigation.

There are no habitat types or natural heritage features that are likely to result in a concentration of migrating or staging birds. The existing impact of lighting and noise sensory disturbance from the Town of Milton is much larger than from the Project. For these two reasons, there is a high level of confidence in the predicted low magnitude adverse effect of the Project. Therefore, with implementation of established and proven lighting and noise mitigation (*e.g.*, downward projected lights, minimize lighted areas for nighttime work, noise berms), and a high certainty in the effectiveness of such mitigation (as described in the EIS Section 6.5.2.9.3), a follow-up program for sensory disturbance is not warranted.

## Human Health

In the EIS and subsequent response to Panel IRs (see responses to IR3.7, 3.11, 4.29, IR4.80, and **IR5.5**), effects to human health were assessed based on modelled air quality and noise emissions. Where uncertainties are discussed in the HHRA TDR (EIS Appendix E.7), a conservative approach was taken to overestimate potential risks. The estimate of emissions is conservative in nature, meaning the emissions used in the assessment are almost always higher than actual, on a given day or on average throughout the year (as discussed in response to IR3.16, CEAR #613).

Based on predicted changes to air quality and noise in the area, Project-related emissions are expected to result in negligible effects and the Project will not likely result in a change to human health (EIS Section 6.5.4.9.3). As noted in response to IR4.29, results of the cumulative HHRA for the years 2021 and 2031 indicate that Project-related emissions are not expected to result in changes to human health compared to the conditions predicted for that area that are independent of Project operations (*i.e.*, Baseline conditions and non-Project related traffic expected in the future). Further, as to be discussed in response to IR4.80, potential effects from Project noise to human health are expected to be negligible, whereby modelled Project related noises and change in %HA are lower than the Health Canada limits for evaluating human health impacts from noise. Due to the conservatism built into the air quality and noise assessments on which the Human Health assessment is based, the confidence in the Human Health predictions and proposed mitigation measures is high, and therefore, a follow-up program for Human Health is not warranted.

Notwithstanding these conclusions, monitoring of air quality and noise levels will be completed as proposed in EIS Section 9.4.1 and 9.4.2; the results of which will be compared to data used in the assessment of human health effects. If measured data are substantially higher than modelled data (*i.e.*, differences that would suggest the conclusions of the EIS are not supported), such variances (and the potential human health implications) will be reviewed and considered through implementation of adaptive management measures, as appropriate (see response to **IR5.14** for information on adaptive management for air quality and noise).



## Effects of the Environment on the Project

Emergency management systems, preparedness and response procedures will be in place (refer to EIS Section 9.7) and will address conditions that may occur as a result of the unlikely events of extreme weather, changes in climate conditions or geophysical/geotechnical hazards. Project components have been and will be designed to endure the potential effects of the environment on the Project, such as erosion, flooding, extreme weather.

Climate variability has been considered in the design of the SWM ponds, whereby the resiliency approach was used to design the SWM system to accommodate increased precipitation, potentially from climate change, into the design of the SWM system, channel realignments and regional flow diversion channel (see response to IR3.33, CEAR #613). As such, the effects of climate change, including warmer temperatures, increased frequency / intensity of storm events, and flooding, have already been and will continue to be accommodated in the design of the Terminal (EIS Section 9.4.4).

Mitigation measures, including regular inspection and maintenance programs by CN and inspections following extreme weather, will identify areas of concern or deficiencies to be addressed / rectified. Any noticeable erosion or excess backflow of water during (or following) extreme weather events would result in the implementation of appropriate maintenance and/or remediation to provide necessary changes on an as needed basis. Based on the high confidence in these mitigation measures to effectively address the effects of the environment on the Project, no follow-up program specific to effects of the environment on the Project is proposed.

## Accidents and Malfunctions

No follow-up program is proposed for potential effects on the Project from accidents and malfunctions because potential effects are related to extreme and unlikely events occurring. Occurrence of an accident and / or malfunction would be managed through emergency preparedness and response plans.

The need to monitor effects of an accident or malfunction and/or effectiveness of measures taken to mitigate those effects will be determined at the time of the accident or malfunction, as part of the response planning, depending on the nature of the accident or malfunction. As described in the EIS Section 6.6.2.3, CN has response plans currently in place to manage any issues related to safety, accidents and malfunctions. Emergency preparedness and response planning is an effective way to anticipate and prevent potential accidents and malfunctions, and to identify the measures to be employed to prevent or minimize adverse environmental effects resulting from the incident.

CN employees will be trained to identify, notify and respond appropriately to an accident or malfunction at the Terminal. In the event of an accident or malfunction, there will be action plans in place to address the situation (see responses to IR5.22 and IR5.24). In that sense, monitoring for potential accidents and malfunctions will occur on a continuous basis.

## Waste Management

Waste generated during the design and operation of the Terminal will be disposed of in accordance with provincial regulations, with wastes to be either recycled or disposed of through licensed waste disposal companies at licensed facilities (EIS Section 3.4.3.4).



Construction waste removal will be incorporated into the construction contractor's contract; waste will be removed to appropriate off site locations. Only qualified contractors will be used to handle waste for the Terminal. Similarly, sanitary waste will be collected by a licensed sanitary waste hauler and disposed at a licensed disposal facility. Any hazardous solid or liquid waste generated by the Project will also be hauled off-site by licensed contractors to licensed disposal facilities. Waste management during operation of the project will be conducted by third party contractors who are licensed by the Province of Ontario to collect and properly dispose of waste materials. This creates a high level of certainty that potential interactions between waste and the environment will be limited and effects appropriately mitigated through licensed waste disposal companies at licensed facilities. A high confidence level on the effectiveness of such waste management companies and their programs has been established. As such, a follow-up program specific to waste management is not proposed.

### **Truck Traffic**

A follow-up program is not warranted because of the high certainty of on-site truck traffic compliance with CN guidelines, procedures and safeguards. Drivers / operators found to be in non-compliance with on-site requirements will be monitored through the biometrics system installed at the in/out gates. Persistent non-compliance with on-site requirements would result in notice and possible disciplinary action, including loss of access to the Terminal.

On-site truck traffic will be monitored by CN personnel and managed through the design of the Project to allow for efficient and safe operations, including the automated gate system at entry and exit locations for the Terminal. CN Police will also monitor overall security at and around the Project, as required.

Similar to other construction projects, traffic during construction will be managed by the prime contractor through appropriate schedules, signs and site management, including specific access, on-site routes and traffic management.

There are no follow-up programs for traffic beyond the boundaries of the PDA as traffic on public roadways is beyond the care and control of CN. Once the trucks leave the Terminal they will be treated in the same fashion as truck currently circulating on public streets. Traffic on regional and provincial roadways is highly regulated and there is confidence in the effectiveness of those parties to enforce their own regulations.

### **IR5.12 Construction monitoring**

**Rationale:** *In Section 9.1 of the EIS, CN proposed a construction monitoring program to assess the effectiveness of construction mitigation measures and to note whether any of these measures were adapted or revised during construction.*

*In its EIS, CN used the definition for a follow-up program from the Canadian Environmental Assessment Act, 2012, and a definition for monitoring from Practitioners Glossary for the Environmental Assessment of Designated Projects Under the Canadian Environmental Assessment Act, 2012. Specifically, a follow-up program means "a program for verifying the accuracy of the environmental assessment of a designated project and determining the effectiveness of any mitigation measures". Monitoring means "periodic or continuous surveillance or testing, according to a pre-determined schedule, of one or more environmental components. Monitoring is usually*



conducted to determine the level of compliance with stated requirements or to observe the status and trends of a particular environmental component over time”.

Although these two activities may be linked, for the purpose for the environmental assessment, they are distinct activities. The Review Panel encourages CN and all participants to ensure the appropriate distinctions are reflected in preparation of their submissions.

In subsection 7.1.2.1 of the EIS summary (CEAR #58), and partially reflected in subsection 9.5.1 of the EIS, CN indicated that construction monitoring would generally include, but not be limited to, the following:

- monitor dust (PM2.5) levels at selected off-site locations during the construction phase will confirm the modelling and the effectiveness of the mitigation measures;
- inspection of erosion and sediment controls to ensure proper installation and maintenance;
- monitoring for total suspended solids and turbidity for any discharges from the construction site;
- monitoring to confirm compliance with detailed design plans during channel realignment;
- monitoring of maximum acceptable vibration levels for any construction activities within 50 m of identified heritage resources; and
- visual observations for any additional archaeological resources potentially encountered during ground disturbance.

It is not clear whether CN may conduct additional construction monitoring and, if so, under what conditions that monitoring might occur. A complete list of construction monitoring commitments is required.

**Information Request:**

- a) Provide a complete list of construction monitoring commitments that CN plans to implement, including a description of any conditions that would require additional monitoring.

**CN Response:**

The proposed monitoring program consists of two components (EIS Section 9.1):

- compliance monitoring to verify whether proposed mitigation measures were implemented; and,
- construction monitoring to verify whether implemented mitigation measures during the construction of the project are functional, and whether any of these measures were revised during construction.

The construction monitoring details will be documented as a component of the EPP, which is to be developed in coordination with the construction contractor and will include Best Management



Practices (BMPs) and specific mitigation measures and commitments made by CN through the regulatory approval process (EIS Section 9.8).

At this time, the complete list of construction monitoring commitments that CN plans to implement includes:

- inspection of erosion and sediment controls to ensure proper installation and maintenance (EIS Section 9.5.1);
- monitoring for total suspended solids and turbidity for any discharges from the construction site (EIS Section 9.5.1);
- monitoring to confirm compliance with detailed design plans during channel realignment (EIS Section 9.5.1);
- monitoring of maximum acceptable vibration levels for any construction activities within 50 m of identified heritage resources (EIS Section 9.5.1);
- visual observations for any additional archaeological resources potentially encountered during ground disturbance (EIS Section 9.5.1);
- in the event of dewatering, CN will monitor private wells expected to be located within the dewatering cone of depression, if any (as estimated from the dewatering assessment) for drawdown interference, which could potentially affect the operation of private wells with regards to water quantities (as identified in response to CEEA IR23);
- in the event that vegetation clearing activities during the breeding season are required, CN will conduct nest sweeps (EIS, Table 7.1; as identified in response to IR23);
- CN will develop a noise monitoring protocol prior to major construction. If a concern of exceedances is established, continuous monitoring may be required. If the sound levels are within the limits discussed in this report, a periodic or complaint-based monitoring will be considered (EIS Appendix E.10; CN response to IR23); and,
- monitoring of general construction activities will be completed by a qualified Environmental Monitor, while conducting regular assessments of protection measures and monitoring for compliance with environmental requirements (EIS Section 9.5.1).

The Environmental Monitor will also provide guidance on compliance should issues arise during construction, documenting any revisions that are made to design and mitigation plans and documenting the results. The roles and responsibilities of the Environmental Monitor will be included in the EPP developed in coordination with the construction contractor.

Through consultation with the applicable regulators described in response to **IR5.13**, any BMPs or specific mitigation measures and commitments made by CN through the regulatory approval process will be incorporated into the EPP (EIS Section 9.8).

Other follow-up programs, such as monitoring dust (PM<sub>2.5</sub>) levels at selected off-site locations during the construction phase (EIS Section 9.4.1), will be conducted during construction, but are not considered construction monitoring activities (*i.e.*, for the purposes of distinguishing between follow-up programs and monitoring programs, as discussed in response to **IR5.11**). These follow-up programs are listed in EIS Section 9.4 and are further discussed in response to **IR5.11**.



### **IR5.13 Participation in monitoring programs**

**Rationale:** In section 9.4 of the EIS, CN identified that for some of its follow-up programs – including air quality and fish and fish habitat – the type of ambient monitoring equipment, selection of monitoring stations, frequency of sample collection, and duration of the monitoring program would be based on appropriate guidelines and in consultation with government regulators. However, CN did not indicate which specific regulators it commits to involve in the design of the follow-up program and other monitoring activities and how they will be involved.

Additionally, CN did not describe whether other non-regulatory expert authorities, Indigenous groups, or the public would be involved in the design and implementation of the follow-up programs or monitoring activities. Although in Section 5.7 of the EIS CN stated invitations for Indigenous groups to participate as monitors during the follow-up and monitoring programs would be extended to all communities, no clarification was provided on which specific follow-up programs Indigenous groups were invited to participate in as monitors, or how the Indigenous groups would be involved.

#### **Information Request:**

- a) Identify which regulatory bodies CN is required to involve in the design and implementation of follow-up program and other monitoring activities and how they will be involved.
- b) Indicate which non-regulatory bodies, including expert authorities or public groups CN commits to involve in the design and implementation of its follow-up program and other monitoring activities, and how they would be involved.
- c) Clarify what specific follow-up programs Indigenous groups were invited to participate in as monitors, and how the Indigenous groups would be involved.

#### **CN Response:**

- a) Identify which regulatory bodies CN is required to involve in the design and implementation of follow-up program and other monitoring activities and how they will be involved.

CN is currently anticipating the involvement in the design and implementation of follow-up programs and monitoring activities by DFO, the Canadian Transportation Agency (CTA) and CEAA. The nature of the involvement of these regulatory bodies is described below.

#### **Fisheries and Oceans Canada**

Authorization under the *Fisheries Act* is required from DFO for the proposed realignment of Indian Creek and Tributary A, in conjunction with the proposed culverts on Tributary C. The implementation of mitigation measures, offsetting plans, monitoring requirements and follow-up programs will be included as conditions of the Authorization by DFO. CN has initiated consultation with DFO in this regard and will continue consultation with DFO to finalize the design and implementation of such measures, including the follow-up program and other monitoring activities.



### **Canadian Transportation Agency**

As part of a Section 98 approval process under the *Canada Transportation Act*, the CTA may direct CN to undertake monitoring or follow-up programs, such as acoustic monitoring. Any monitoring or follow-up program requirements specified by the CTA will be identified in the CTA decision. Results of monitoring or follow-up specified in the CTA decision will be provided to the CTA, as required, and any additional monitoring or follow-up requirements, if any, would be discussed with the CTA at that time. The anticipated acoustic monitoring program will be consistent with CTA methodologies (see response to IR4.82 for additional information on the proposed acoustic monitoring program). In addition, the CTA will have direct input and play an active role as a participant in the Joint Review Panel process.

### **Canadian Environmental Assessment Agency**

If and as required (*i.e.*, if and as specified in the Decision Statement), CEAA would be involved in the review and approval of the proposed follow-up program and monitoring activities for the Project. It is anticipated that the components of the Environmental Management Plan (listed in the EIS, Table 9.2), which will include monitoring commitments, would be reviewed and approved by CEAA as a condition of the Decision Statement. These plans, along with the reporting requirements for the proposed construction and compliance reports (EIS Section 9.6.2) and follow-up monitoring programs (EIS Section 9.6.1), would be prepared and submitted as specified in the Decision Statement.

Copies of the various follow-up and monitoring reports, including those listed in Section 9.6 and 9.7 of the EIS, will be submitted to CEAA on the submission schedule specified in the Decision Statement. Based on the results of the follow-up and monitoring activities, the need for additional monitoring or mitigation measures will be identified as part of the adaptive management approach and confirmed through consultation with CEAA (as well as other applicable federal regulatory agencies, such as DFO and CTA), as required.

Some of the conditions of approval specified in the Decision Statement may require input from other federal authorities to advise or inform CEAA on specific follow-up programs or monitoring activities.

*b) Indicate which non-regulatory bodies, including expert authorities or public groups CN commits to involve in the design and implementation of its follow-up program and other monitoring activities, and how they would be involved.*

Non-regulatory bodies, including members of the public, were engaged during the preparation of the EIS (as described in the EIS Section 4) and subsequently through ongoing consultation efforts by CN, CEAA, and the Review Panel.

Other government agencies and expert authorities that CN anticipates consulting through meetings, information exchange and other means, as appropriate, as part of ongoing engagement efforts may include:

- Ontario Ministry of Natural Resources and Forestry
- Ontario Ministry of the Environment and Climate Change



- Ontario Ministry of Tourism, Culture and Sport
- Conservation Halton
- Region of Halton
- Town of Milton

Discussions between CN and Ducks Unlimited Canada have resulted in the development of a plan to compensate grassland migratory bird and Monarch habitat (as discussed in response to IR4.55), which will include a follow-up program to confirm use of the newly created offsite habitat by Bobolink, Eastern Meadowlark and Monarch. The details of this follow-up program will be confirmed with Ducks Unlimited Canada prior to establishment of the new habitat.

Through the Review Panel process, consultation is ongoing and stakeholder input will continue to be considered in order to refine the follow-up programs and other monitoring activities, as appropriate.

*c) Clarify what specific follow-up programs Indigenous groups were invited to participate in as monitors, and how the Indigenous groups would be involved.*

Aboriginal communities have been involved in a variety of monitoring opportunities associated with the preparation of the EIS and response to information requests from CEAA. CN has committed to continue engaging with the Aboriginal communities in the future during the environmental assessment review process and construction phase of the Project, including the proposed follow-up programs.

Of the four Aboriginal groups that have been identified by CEAA, three showed interest in being involved in archaeology for the Project, consistent with the requirements specified in Section 5.1 of Part 2 of the EIS Guidelines. Aboriginal community representatives participated in the archaeological field work and Aboriginal communities provided comments during the archaeological report review process. Details of Aboriginal involvement to date in the archaeological assessments are provided in the response to IR4.37.

In addition to their involvement to date with the archaeological assessments, representatives from MNCFN were present as monitors during all field surveys conducted in support of the EIS and subsequent site investigations in 2017 (conducted in response to IR1 (CEAR #[561](#) and #[574](#)). During the field investigations conducted to characterize existing conditions (e.g., electrofishing surveys; breeding bird, basking turtle, and snake cover board surveys; surface water surveys and water quality sampling, etc.), representatives from the MNCFN were invited and participated as monitors to accompany field biologists, ecologists and other field specialists.

As part of the proposed follow-up programs, representatives of the Aboriginal Communities will be invited to accompany CN during proposed follow-up and monitoring programs for the Project (e.g., air quality and noise; surface water; aquatic monitoring) as well as during other field programs proposed as mitigation for the protection of wildlife (i.e., turtle and snake relocation measures). Aboriginal communities will be notified when results of these programs are posted to the Project website (see response to **IR5.16**).



As noted in response to **IR5.10**, for archaeological sites with distinct Aboriginal heritage, CN and Stantec are working with Aboriginal communities to identify each archaeological site with a place name. Currently, the archaeological sites are identified with numerical designations (*i.e.*, Location 1, Location 2, etc.), which do not provide archaeological or heritage context. Rather, they simply ascribe the general order in which the archaeological resource was identified during the Stage 2 survey of the PDA. Ascribing place names provided by participating Aboriginal communities provide an opportunity to commemorate the archaeological site and their contributions to the CHVI of the site. Once determined, the place name for each site will be registered with the MTCS's *Archaeological Sites Database*.

An Archaeological Resources Protection Plan (the ARP Plan) will be implemented during the construction phase of the Project. The ARP Plan will provide guidance to Project personnel in the event of a chance find of an archaeological resource. In the event of the identification of an Aboriginal archaeological resource, Aboriginal communities will be notified of the find and engaged during the development of any assessment and mitigation plan for the archaeological resource.

Additional information regarding follow-up and monitoring programs is provided in response to **IR5.16 (b)**.

#### **IR5.14 Adaptive management as part of a follow-up program**

##### **Rationale:**

*In Section 9.1 of the EIS, CN indicated that one of the objectives of the follow-up program was to provide for adaptive management measures and contingency planning should environmental effects differ from those predicted, or as a result of new information. In Section 9.4, CN stated that follow-up programs were proposed in particular for areas where scientific uncertainty exists in the prediction of effects.*

*CN stated that adaptive management would be inherent in the design of the EIS follow-up programs and that the purpose of the follow-up programs would be to ensure that the monitoring elements remain valid, meet regulatory requirements and are responsive to evolving objectives.*

*Preliminary adaptive management plans are required for topics where scientific uncertainty exists in the prediction of effects. Preliminary adaptive management plans should describe the objectives, indicators and thresholds that will be used to verify that the mitigation measures are successful, what exceedances would trigger management action and examples of additional mitigation measures that could be used in those cases.*

*CN has not indicated the frequency with which it would review monitoring results for each valued component, in order to verify if adaptive management may be required. In addition, CN has not provided preliminary adaptive management plans.*

##### **Information Request:**

- a) Clarify how frequently CN would review monitoring results to verify if adaptive management would be required.



b) Provide a preliminary adaptive management plan for each topic where scientific uncertainty exists in the prediction of effects. Each adaptive management plan should include at a minimum:

- a description of the uncertainties that necessitate the use of adaptive management;
- a clear statement of the mitigation objective being pursued;
- indicators that will be used to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure(s);
- thresholds to which monitoring results would be compared to determine whether modified or additional mitigation measures are required; and
- a description of the modified or additional mitigation measures that CN could implement if thresholds are exceeded.

If applicable, in developing the response to this information request, consider responses to other information requests in this package, namely information request 5.11 (Follow-up programs).

**CN Response:**

a) Clarify how frequently CN would review monitoring results to verify if adaptive management would be required.

The results of follow-up and monitoring programs will be reviewed at various frequencies (i.e., weekly, monthly, semi-annually, annually) depending on the frequency of data monitoring associated with these programs, as summarized in **Table IR5.14-1** (follow-up programs) and **Table IR5.14-2** (monitoring programs). Follow-up and monitoring results will be evaluated after each monitoring event and adaptive management will be applied only if results of each program warrant additional follow-up or changes specific to each program.

**Table IR5.14-1 Monitoring Result Review Frequency for Follow-up Programs**

Program	Frequency of Monitoring	Frequency of Review of Monitoring Data/Results	Comments
Air Quality (EIS Section 9.4.1)	Continuous monitoring for the first 4 weeks of construction.	Weekly for the first 4 weeks of construction.  If complaints are submitted, adaptive management to review monitoring results may be initiated.	Assessed for effectiveness of dust control (PM <sub>2.5</sub> ) during construction.
Acoustics (EIS Section 9.4.2)	Continuous monitoring for the first 4 weeks of construction.	Weekly for the first 4 weeks of construction.  If complaints are submitted, adaptive management to	Monitoring will determine ambient noise levels based on construction activities.



Program	Frequency of Monitoring	Frequency of Review of Monitoring Data/Results	Comments
		review monitoring results may be initiated.	
	Post-construction acoustic verification (single program).	One single monitoring period within the first 4 weeks of operation.  If complaints are submitted, adaptive management to review monitoring results may be initiated.	Post-construction acoustic verification will assess ambient noise is compliant with regulatory guidelines and used to assess effectiveness of noise mitigation measures (e.g., berms, location of equipment).
Surface Water – Water Quantity and Quality (EIS Section 9.4.4.1)	Quarterly (unless frozen or dry) during operations for the first 3 years of operation of the Terminal.	Results will be reviewed quarterly, reporting will be completed annually.	Planned for discharge and receiving water locations Number of samples and frequency of samples determined based on applicable guidelines.
Surface Water – Channel Stabilization and Restoration (EIS Section 9.4.4.2)	Bi-annually (spring and fall) following establishment of constructed channel (year 0) and for the first 3 years post-construction.	Results will be reviewed semi-annually (spring, fall), reporting will be completed annually in combination with Water Quantity and Quality reporting.	Spring Assessment – visual assessment, including photo documentation of instream structures for geomorphic and aquatic conditions, and fisheries assessment (see below).  Fall Assessment – geomorphic assessment of stream characteristics (profile, pattern, dimensions, pebble counts); yearly visual assessment of quality of fish/overall aquatic habitat; yearly assessment of quantity and diversity of fish species; and vegetation assessment.
Fish and Fish Habitat (EIS Section 9.5.1)	Annually (spring), as part of the surface water program for the first 3 years post-construction.	Results will be reviewed annually, reporting will be completed annually.	Confirm compliance with fisheries offsetting measures and habitat effectiveness monitoring.
Migratory Birds and their Habitat / Species at Risk (EIS Section 9.4.6 and 9.4.7; response to IR4.56)	Based on Ducks Unlimited (DU) monitoring program.	Results will be reviewed by DU.	CN will work with DU to create grassland habitat for Bobolink, Eastern Meadowlark and Monarch within the same ecoregion as the Project.
Cultural Heritage	Continuous monitoring if construction activities occur within	Continuous review of results during active monitoring.	If determined through detailed design that a 50-m construction buffer cannot

Program	Frequency of Monitoring	Frequency of Review of Monitoring Data/Results	Comments
(EIS Section 9.4.12; response to IR4.35)	50 m of CHR-1, CHR-2, CHR-4, CHR-5, and CHR-6.	If exceedances are observed, adaptive management to reduce effects will be implemented.	be maintained from these cultural heritage resources, construction vibration monitoring will be implemented for these cultural resources.
Archaeological Resources (EIS Section 9.4.13)	Continuous monitoring during ground disturbance activities (i.e. grading).	Continuous review of results during active monitoring.  If artifacts are observed, adaptive management to reduce potential effects through appropriate mitigation will be implemented.	Details to be provided in the Archaeological Resources Protection Plan.

**Table IR5.14-2 Monitoring Result Review Frequency for Monitoring Programs**

Program	Frequency of Monitoring	Frequency of Review of Monitoring Data/Results	Comments
Construction Monitoring (EIS Section 9.5.1)	Daily and weekly; dependent on specific activities.	Results will be reviewed daily and weekly based on construction activities.	To be detailed in the Environmental Protection Plan.
Compliance Monitoring (EIS Section 9.5.2)	Daily, weekly, seasonally or annually.	Results will be reported based on environmental approvals, permits and authorizations.	Dependent on environmental approvals, permits and authorizations.

b) Provide a preliminary adaptive management plan for each topic where scientific uncertainty exists in the prediction of effects. Each adaptive management plan should include at a minimum:

- a description of the uncertainties that necessitate the use of adaptive management;
- a clear statement of the mitigation objective being pursued;
- indicators that will be used to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure(s);
- thresholds to which monitoring results would be compared to determine whether modified or additional mitigation measures are required; and
- a description of the modified or additional mitigation measures that CN could implement if thresholds are exceeded.



For the CN Project and as described in the EIS Section 9.3, adaptive management will be integrated into all follow-up and monitoring programs, as programs will remain dynamic and flexible throughout their implementation to accommodate changing circumstances / requirements and ensure adverse effects are managed and are responsive to address regulatory requirements.

Adaptive management is not a program or plan, rather it is a systematic process for continuously improving environmental management practices by learning about their outcomes. It involves, among other things, the implementation of new or modified mitigation measures over the life of a project to address unanticipated environmental effects (CEAA Glossary 2013). Through the follow-up and monitoring programs, any identification of an issue (*i.e.*, nonconformance to regulatory approvals or effects that are substantively worse than predicted effects), either during review of monitoring results or through compliance evaluation, will be assessed and evaluated and through implementation of adaptive management, a determination of appropriate corrective actions will be made. This may result in refinements or additional mitigation measures, modification to a follow-up or monitoring program, or change in monitoring frequency.

Follow-up programs have been proposed for the Project, as described in the EIS (Section 9.4) and in response to **IR5.11**. These programs have been developed to supplement the technical data collected as part of the EIS, as well as to verify the accuracy of the effects assessment and to determine the effectiveness of the mitigation measures to reduce any resulting adverse effects of the Project. Follow-up programs are proposed for areas where scientific uncertainty exists in the prediction of effects and/or effectiveness of mitigation.

Some follow-up programs have been designed to incorporate supplemental data collection since the submission of the EIS in December 2015 (as listed in response to **IR5.15**). Other supplemental data has been collected in response to requests from the Review Panel (*i.e.*, air quality, noise, surface water, fish and fish habitat and wildlife – see IR1.1 through IR1.6) to refine existing conditions.

## **Air**

The effect predictions within the EIS are based on modeling results, however, modeling is inherently uncertain. A conservative approach was used, so the confidence in the model results is high, but, nevertheless, monitoring is proposed to confirm the effect predictions.

CN will conduct ambient air quality monitoring for airborne particulate matter during the Project construction phase and for 12 months after the start of operation to confirm the modeling and the effectiveness of the mitigation measures for dust suppression. A detailed monitoring plan and sampling schedule will be prepared as part of the detailed design (at least six months prior to the commencement of construction). This timing helps to ensure that the expected construction workplan and final detailed design aspects of the facility are properly considered in the monitoring program, as mitigation measures to reduce criteria air contaminants (CACs), Hazardous Air Pollutants (HAPs) and greenhouse gas (GHG) emissions will be incorporated through best management practices into Project design wherever possible.

Ambient air quality data collected as described above will be reviewed monthly. Collected data will be to confirm the prediction in the EIS is accurate (as reported in the EIS, Appendix E.1 Air Quality Technical Data Report). Any exceedances of applicable criteria would be identified, and any potential corrective measures will be considered and implemented, as necessary. Actions to



deal with exceedances may include potential changes to activities or timing of activities (e.g., frequency of dust suppressants employed, area over which dust suppressants are used) during construction until such time that air quality related to the Project meets the applicable regulatory criteria. After the first phase of construction, providing the concentrations are in compliance with applicable regulatory criteria, the frequency of review and analysis of air quality monitoring data will be completed on a quarterly basis.

## **Acoustic Environment**

The effect predictions within the EIS are based on modeling results, however, modeling is inherently uncertain. A conservative approach was used, so the confidence in the model results is high, but, nevertheless, monitoring is proposed to confirm the effect predictions.

Results of acoustic modeling predict that noise levels from construction and operation activities will be within applicable limits at the off-site receptors. CN will develop a follow-up program that includes an acoustic verification process to verify predicted effects outlined within the EIS Appendix E.10. In addition, audit results will be used to assess the effectiveness of noise mitigation measures.

CN will conduct a construction noise monitoring program during the first four weeks of the construction phase (EIS, Section 9.4.2). The detailed monitoring plan, measurement and reporting schedule and related noise abatement action plan will be prepared as part of the detailed design (at least six months prior to the commencement of construction). This timing helps to ensure that the expected construction workplan and final detailed design aspects of the facility are properly considered in the monitoring program.

Noise monitoring will be reviewed monthly, with daily exceedance notifications provided through cloud-based technology. Any exceedance notifications would be identified and investigated within 24 to 48hrs of an exceedance notification, and adaptive management will be considered and applied through potential corrective measures, as necessary. Actions to deal with exceedances may include potential changes to activities or timing of activities during construction.

The detailed construction monitoring plan will have further details, as described in the response to **IR5.17**.

CN has committed to an acoustic verification process to assess operational noise for the Project, as referenced in the response to IR4.82. The applicable operational noise criteria for the adaptive management plan will be the Health Canada's criterion of a change in %HA of less than 6.5 % and the 75 dBA  $L_{DN}$  noise limit. The original ambient noise monitoring locations identified in Figure 2 in EIS Appendix E.9 will be used to verify operational noise effects for the Project. The operational noise levels will be compared against criteria to determine the effectiveness of the mitigation measures. If levels are not aligned with Health Canada criteria (with the installed mitigation measures), CN will complete a noise abatement plan to address the variance (see response to IR4.82).

## Surface Water

- Monitoring is planned for the three surface water components related to the Project: Surface Water Quantity
- Surface Water Quality
- Channel Realignment

### Surface Water Quantity

Flows for different environmental conditions (i.e., flood, baseflow and environmental) are predicted to have localized changes to surface water quantity within the PDA and minor changes in the LAA (EIS Appendix E.15, Section 7.2). The predicted changes in flow regimes for flood and low flow conditions within Indian Creek and its tributaries (A, B, C and D) are based on modeling, which are inherently uncertain (reference the response to IR3.36 (c) that presents uncertainty related to input data and model prediction). Therefore, a conservative approach was used (i.e., input parameters, design of the SWM ponds) with consideration of accepted guidelines and standard mitigation measures, so the confidence in the model results is high, but, nevertheless, monitoring is proposed to confirm the effect predictions.

The objective of the surface water quantity mitigation measures for the Project is to maintain the flow regime within Indian Creek within the normal variability of existing conditions and limited to the PDA (EIS Appendix E.15, Section 6.2.4.1) after construction of the Project is completed and all the changes within Indian Creek and Tributary A are made.

A surface water quantity monitoring program will be developed and executed within the PDA to record changes in water quantity (flow rates) for a minimum of three years following completion of the construction phase of the Project and summarized in an annual report. The flow rates will be estimated using a combination of periodic channel velocity, depth and flow profiling measurements, and continuous water level monitoring.

Following each quarterly water quantity monitoring site visit, the results will be reviewed. An annual water quantity monitoring report will review results against the existing condition flow and climate data from the June 2015 to June 2016 monitoring period for TRIB A, IC2 and IC3 stations (Attachment IR2, CEAR #561), as well as the predicted flood flow and low flow regimes in EIS Appendix E.15 and response to IR3.26 (i.e., Tributary A and Indian Creek hydrographs). The assessment will specifically focus on identifying whether there is an observed increase or decrease in Tributary A and Indian Creek flows outside the predicted changes identified in the EIS at any of the three monitoring sites from the Project, and the SWM Pond outflows. For flood flow conditions this will be whether flows are maintained at existing conditions or below. For baseflow/low flow conditions this will be if flows out of the SWM Ponds are maintained at erosion control threshold flow rates. As part of the flow analysis, trends will be assessed to determine if flow rates are moving towards or away from threshold values.

If monitoring confirms flows are outside the range of variability predicted in the EIS, an investigation of cause will be conducted to confirm whether the variability may result in an adverse effect. When the source(s) of the variability has been identified, if warranted based on the potential for adverse effects, then appropriate, additional mitigation measures will be considered, assessed,



designed and implemented as appropriate (*i.e.*, change in the stormwater management (SWM) system design (e.g., orifice size, culvert size) or maintenance schedule)).

Following implementation of modified or additional mitigation measures to address either assessed decreases or increases in surface water quantity, monitoring will continue to assess mitigation measure effectiveness in addressing the impact of concern on an annual quarterly basis at a minimum or appropriate frequency interval based on the problem attributes. The monitoring program may be revised, including additional surface water quantity monitoring sites and increased monitoring frequencies, to provide more detailed assessment of the modified/additional mitigation measure impacts on the surface water flow regime.

### **Surface Water Quality**

The predicted changes in surface water quality within Indian Creek and its tributaries (A, B, C and D) are based on predictions of the removal of contaminants by the SWM system, the ceasing of agricultural activities within the PDA (*i.e.*, removing existing sources) and through the implementation other mitigation measures (*i.e.*, restoration and naturalization, slope stabilization).

The ranges of expected influent and effluent loads from the SWM system are provided in response to IR3.37, which are based on literature value ranges and SWM system efficiency calculations (provided in response to CEAA IR16-2, Table 4 (CEAR #375), which represent the uncertainty of the predicted values based on the methods used within the SWM treatment train. Therefore, a conservative approach was used (*i.e.*, treatment train design redundancy, predictive modelling) with consideration of accepted guidelines and standard mitigation measures, so the confidence in the prediction results is high, but, nevertheless, monitoring is proposed to confirm the effect predictions.

The objective of the mitigation measures is to maintain positive and low magnitude changes to surface water quality in the Tributary A and Indian Creek channel sections within the PDA (EIS Appendix E.15, Section 6.4.2.2).

The indicators that will be used to assess the effectiveness of the mitigation measures will include changes in water quality (chemical concentrations/loads and physical parameters [*i.e.*, temperature]) for a minimum of three years following completion of the construction phase of the Project. Results will be summarized in an annual report. Water quantity (flow rate) monitoring will be conducted to calculate chemical parameter loads.

Water quality samples from the monitoring stations TRIB A on Tributary A, and IC2 and IC3 on Indian Creek, along with samples collected at the outlets of SWM ponds 1 and 2 prior to discharge in Tributary A and Indian Creek, will be collected and submitted quarterly for analysis at an accredited laboratory. Field measurements for appropriate parameters, such as temperature, dissolved oxygen and pH would be collected at each site during each water quality sampling event. Monitoring results will be compared annually against the baseline condition (June 2015 to June 2016) and RAA water quality data, predicted changes in water quality or contaminant loads and applicable criteria (Canadian Council of the Ministers of the Environment [CCME] Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life [CWQG-FAL] (EIS Appendix E.15). Trends in parameter values away from or towards a criteria exceedance will be analyzed as part of the monitoring program. The monitoring program will specifically focus on whether there are observed increases in contaminants of concern concentrations, or changes in non-concentration parameter values or trends in parameter values outside the predicted changes

identified in the EIS at any of the five monitoring sites and whether there are any exceedances of applicable criteria.

If monitoring confirms a water quality parameter or parameters is or are trending towards or exceeding applicable criteria outside the range of variability predicted in the EIS, an investigation of cause will be conducted to confirm whether an unforeseen adverse effect is anticipated. If necessary, appropriate mitigation measures will be assessed, designed and implemented including additional ESC measures and a change to maintenance schedules of the Terminal (*i.e.*, increased sweeping, inspection of culverts, storm sewers, etc.).

If there is an observed substantial increase in contaminants of concern attributed to the Project post-construction of the Terminal, either within Tributary A and/or Indian Creek (*i.e.*, where SWM Pond outlets exceed applicable criteria), potential modified or additional mitigation measures that could be implemented include additional or change in location of ESC measures, revisions to sweeping frequencies of the Terminal, and SWM system maintenance schedules.

Following implementation of modified or additional mitigation measures to address either assessed increase in contaminants of concern concentrations or negative changes to other water quality parameter values beyond applicable limits, surface water quality monitoring will continue to assess mitigation measure effectiveness in addressing the impact of concern. The monitoring program may be revised, including additional surface water quality monitoring sites and increased monitoring/sampling frequencies, to provide more detailed assessment of the modified/additional mitigation measure impacts on surface water quality.

### **Channel Realignment**

The channel realignments for Tributary A and Indian Creek are predicted to provide stable, sinuous watercourses with varied in-channel features (riffles, pools) with good access to a well-vegetated floodplain and riparian wetland features (EIS Appendix E.2, Executive Summary). The predicted features of the channel realignment have been designed using the threshold design and reference reach approach and are expected to provide channel characteristics comparable to those referenced channels.

Potential channel realignment uncertainty exists regarding the effectiveness in the proposed design in maintaining threshold design sediment transport, conveying channel forming flows within the proposed bankfull elevation, reducing channel and bank instability, maintaining effective floodplain form and function, and creating productive fish, riparian and floodplain habitat.

The objective of the channel realignment mitigation measures for the Project is to maintain a stable channel planform with improved habitat for aquatic species with good floodplain access to maintain floodplain storage and elevation conditions (EIS Appendix E.2, Executive Summary).

A channel realignment monitoring program will be developed and executed within the PDA to assess the post-construction condition of the channel realignment sections for a three-year period following construction and summarized in an annual report. The following indicators and methods to measure them will be monitored to confirm the channel realignment is stable and as part of that program:



- Assess whether installed channel features are stable with no excessive erosion using quarterly topographic surveys of the following in Indian Creek and Tributary A realignments:
  - Select longitudinal thalwegs realignment stream patterns with survey stations, two riffle cross-sections and two pool cross-sections for each channel realignment section from permanent benchmarks establishing during the initial monitoring site visit.
  - Conduct riffle pebble counts within riffle cross-sections to assess that bed particle size remains consistent over the monitoring period. Permanent benchmarks will be established for each geomorphic condition monitoring site.
- Assess fish populations and productivity are at or above baseline conditions or there is an observed reducing trend in populations and productivity habitat:
  - Monitor using fish collection techniques employed during the EIS baseline study and supplemental assessments within channel realignments and potentially immediately upstream and downstream of the sections.
- Assess the overall aquatic habitat:
  - A qualified fisheries biologist will sample various aquatic habitats within the channel realignments, including potentially upstream and downstream of the alignment sections.
  - Assess changes in vegetation to identify poor health, poor and potentially unstable coverage of channel bed, banks and floodplain by verifying plant materials against the planting plan with seasonal site visits (spring and fall) and associated maintenance of photologs to visually document vegetation health, coverage and stability.

Review of the channel realignment monitoring data following each site visit (quarterly [geomorphic condition]; annual [fish and fish habitat]; and semi-annual [vegetation]) for the Tributary A and Indian Creek channel realignments will be conducted, and results compared against planned design conditions (EIS Appendix E.2) and existing baseline fish population and fish habitat data (EIS Appendix E.4). The assessment will specifically focus on whether there are observed reductions in channel stability, reduced fish habitat usage and productivity in comparison to the existing conditions and will identify any deficient, dead or dying plant materials reducing bank and riparian area coverage and potentially stability.

If there is an observed adverse change in the channel realignment condition for the sections on Tributary A and/or Indian Creek, the causal factor(s) to the channel realignment condition will be identified. Additional mitigation measures that could be implemented include the following:

#### *Geomorphic Condition*

- Repair or modify design of unstable feature (e.g., increased stone size in riffles, alternative bank protection method) within the channel realignment.
- Adjust grade control with additional in-channel features to adjust flow rates and sediment transport characteristics (e.g., stone and woody debris in riffles).
- Clean-up any excessive build-up of debris that may have washed into the channel realignment sections and is altering local flows causing an unstable condition.



### *Aquatic Fish Productivity and Habitat*

- Repair or modify design of in-channel features that potentially would improve fish habitat usage, including riffle feature adjustments to increase nesting and foraging areas.
- Repair or modify design of pools and inner berm features to increase water depths during periods of low flow to support resting and refuge.
- Improve design and construction of connections to riparian wetlands to provide fish spawning habitat, seasonal foraging and resting habitat.
- Address deficiencies in vegetation coverage within bank and riparian areas to increase shading of open water areas through additional vegetation plantings and address potential areas of erosion within the banks and floodplain with in-channel mitigation measures.

### *Vegetation*

- Address deficiencies in vegetative coverage, potential floodplain/bank areas experiencing stability issues or diseased/dying plants by planting additional graminoid or woody vegetation to improve shading over the open water channel sections and address potential floodplain/bank areas experiencing erosion or scour stability issues.

Following implementation of modified or additional mitigation measures to address deficiencies identified during the geomorphic, aquatic and vegetation assessments of the channel realignment sections, channel realignment monitoring will continue to assess mitigation measure effectiveness in addressing the impact of concern. The monitoring program may be revised, including additional photo sites, geomorphic profile, pattern and dimension sites and additional fisheries monitoring sites and sampling frequencies, to provide more detailed assessment of the modified/additional mitigation measure impacts on channel realignment stability, aquatic habitat and vegetative cover.

### **Fish and Fish Habitat**

The uncertainties that necessitate a fish and fish monitoring plan are not the residual effects of the Project, but the implementation of the offsetting plan through success of channel realignment. The EIS concludes that through mitigation and the implementation of an offsetting plan, no residual effects on fish and fish habitat will occur following the implementation of an enhanced stream diversion with habitat features constructed for increased fisheries values.

CN will confirm that fisheries offsetting measures meet their intended objectives as stated in response to IR4.50 (CEAR #[632](#)). This program will consist of two components:

- compliance reporting for offsetting works
- habitat effectiveness monitoring

Compliance reporting will confirm that planned habitat offsets are constructed in accordance with the Milton Logistics Hub Technical Data Report - Channel Realignment (EIS Appendix E.2) and that conditions of the *Fisheries Act* authorization are met. Habitat effectiveness monitoring will confirm that habitat offsets are functioning as intended after construction.



The requirements and frequency of monitoring will consider comments received during the panel review process and in consultation with DFO. It is expected that the monitoring program will be completed as part of the channel realignment monitoring program described above in the surface water section.

Monitoring results will be compared with predictions presented in the EIS report, the Milton Logistics Hub Technical Data Report – Fish and Fish Habitat (EIS Appendix E.4) and DFO guidelines. Productivity will be assessed using methods described in A Framework for Assessing Fisheries Productivity for the Fisheries Protection Program (Bradford et al. 2014). As described in the Channel Realignment section above, should results of monitoring indicate that productivity is below baseline conditions, potential causes for a reduction in productivity of fish habitat will be determined and if attributed to the Project, modifications to the habitat will be made to improve habitat conditions as described above.

### **Archaeology**

As described in Appendix G of the EIS, an Archaeological Resources Protection Plan will be implemented during the construction phase of the Project. The effects on identified archaeological resources have been mitigated through the MTCS's archaeological assessment and mitigation process (*i.e.*, Stage 2 assessment, Stage 3 assessment, and Stage 4 mitigation of development impacts).

Full and complete recovery of all archaeological resources is not practical as the original artifact/resource population is unknown. Given the completion of Stage 2, Stage 3 and Stage 4 archaeological assessment work within the PDA, the likelihood of encountering additional artifacts is low. However, based on the uncertainty, although minimal, there is a potential to encounter chance finds of archaeological resources during the construction phase of the Project. As such, through implementation of the Archaeological Resources Protection Plan, adaptive management will guide Project personnel in the event of a chance find. For example, if an archaeological resource is identified during construction, all construction will cease within a 20 metre radius of the find. A licensed archaeologist will be retained by CN and an assessment and mitigation plan for the archaeological resource will be prepared in accordance with the MTCS's 2011 Standards and Guidelines for Consultant Archaeologists. For Aboriginal archaeological resources, the participating Aboriginal groups will be notified of the find and engaged with during the development of any assessment and mitigation plan, as directed by the Ministry of Tourism, Culture and Sport's archaeological assessment and mitigation process. Construction work around the archaeological resource will not resume until an assessment and mitigation plan has been implemented.

Similarly, any human remains encountered during construction will be treated with respect and all construction around the area within a 20 metre radius will cease immediately. Local police, CN Police, the coroner, and the Cemeteries Registrar at the Ontario Ministry of Government and Consumer Services will be contacted. As applicable, Aboriginal communities will also be contacted. Work will not resume until the site has been cleared by the appropriate authorities.

## REPORTING

### IR5.15 Regulatory reporting requirements

#### **Rationale:**

*In Section 9.6 of the EIS, CN described how it would report on its follow-up and monitoring program. CN stated that copies of construction monitoring reports would be submitted to regulators as requested during construction. CN indicated that it would prepare a report documenting compliance with all environmental approvals, permits and authorizations for dissemination to appropriate agencies, as required by regulators. CN further stated that a post-construction monitoring report would be submitted to the Canadian Environmental Assessment Agency and other applicable agencies on an annual basis.*

*CN did not identify the regulators to which it expected to send reports, and did not indicate the intended frequency or duration of reporting.*

#### **Information Request:**

a) For each type of report that CN proposes to prepare, indicate:

- the regulator(s) or applicable agencies that would receive a copy of each report;
- the information CN anticipates will be sent to each regulator(s) or applicable agencies; and
- the frequency and duration of reporting.

#### **CN Response:**

Reporting requirements will be stipulated within the permits, approvals or authorizations issued by regulators, as well as within conditions detailed in the EA Decision Statement issued by the federal Minister of Environment and Climate Change. Specific reporting requirements, other than those included in the Decision Statement will be confirmed through the permitting process following the environmental assessment process. CN's understanding of reporting requirements in the context of the design and implementation of follow-up programs and other monitoring activities for specific regulators is provided in response to **IR5.13**.

CN anticipates the following:

- **DFO** – If and as required in support of obtaining an Authorization from DFO under the *Fisheries Act*, the following detailed design plans will be circulated to DFO for review and approval, including:
  - Final culvert design drawings;
  - Final channel designs drawings;
  - Erosion and Sediment Control Plan;
  - Detailed construction sequencing plan;



- Final isolation and dewatering plan; and,
- Final restoration and enhancement plan (*i.e.*, planting plan, habitat details).

It is anticipated that the following follow-up and monitoring reports will be submitted to DFO as a condition of the DFO Authorization:

- construction monitoring reports pertaining to the channel realignment and fish/fish habitat aspects, the frequency and duration of which will be specified by the Authorization;
  - post-construction monitoring reports, including the results of the geomorphic assessment, fisheries monitoring, vegetation monitoring, and visual assessment of Project conditions, following construction and annually for three years following the completion of channel construction; and,
  - As-built drawings (*i.e.*, culverts and channel realignments).
- **CTA** – CN has prepared and submitted an application to the CTA for an approval under s.98 of the *Canadian Transportation Act*. CN commits to working with CTA through the review of the Project and will provide any additional reports that the CTA requires as a condition of approval. At this time, no additional reports are anticipated.
  - **CEAA** – If and as required (*i.e.*, specified in the Decision Statement), CEAA would receive copies of the Environmental Management Plan (EIS Section 9.8), including:
    - Environmental Protection Plan (EPP)
    - Emergency Response Plan (ERP)
    - Soil Management Plan
    - Stormwater Management Plan
    - Erosion and Sediment Control Plan
    - Planting Plan

CEAA will also receive copies of the follow-up and monitoring reports, including:

- construction air quality monitoring program results (per EIS Section 9.4.1); the frequency and duration of reporting will be specified in the Decision Statement;
- acoustic audit (per EIS Section 9.4.2) to take place during the first four weeks of the construction phase (EIS Section 9.4.2) and within the first four weeks of the operation (favorable weather pending) (**IR5.13**); the frequency and duration of reporting will be specified in the Decision Statement;
- channel stabilization and restoration report, including the results of the geomorphic assessment, fisheries assessment, vegetation assessment, and visual assessment of Project conditions (per EIS 9.4.4.2; Table 9.1) (following construction and annually for 3 years);
- fish and fish habitat monitoring report per (EIS 9.4.4.3), including fisheries monitoring annually for three years following the completion of channel construction;



- off-site grassland bird habitat and use survey results (per EIS 9.4.6) (to be conducted by Ducks Unlimited, as described in response to **IR5.13**); the frequency and duration of reporting will be specified in the Decision Statement; and
- compliance monitoring report (per EIS 9.6.2), summarizing compliance with all environmental approvals, conditions, permits and authorizations; the frequency and duration of reporting will be specified in the Decision Statement.

Of note, CEAA and the Review Panel have already received the supplemental data collection reports referenced in EIS Section 9.4 and 9.6.1, including:

- Supplemental site specific ambient baseline air quality monitoring (per EIS Section 9.4.1) (provided in response to IR3.1, Attachment IR3.1-1, CEAR #[613](#));
  - Supplemental groundwater monitoring (per EIS Section 9.4.3) (provided in response to Panel IR3.27, Attachment IR3.27-1, CEAR #[613](#)); and
  - Supplemental in-situ water level and stream velocity measurements (per EIS Section 9.4.4.1) (provided in response to Panel IR1.2, Attachment IR2, CEAR #[561](#)).
- **ECCC** – CN has committed to circulate the final restoration and enhancement plans and the final Snapping Turtle Management Plan to ECCC during detailed design for their input. A copy of the preliminary plan has also been provided to ECCC for their review, as discussed in response to IR4.58.

#### **IR5.16 Other reporting**

**Rationale:** In subsection 1.4.3.1 of the EIS, CN indicated that it would apply to the Ontario Ministry of the Environment and Climate Change for an Environmental Compliance Approval for all points of discharge from the Project. CN stated that, as a federal undertaking whose works have been declared to the general advantage of Canada, and given that CN holds a certificate of fitness issued by the Canadian Transportation Agency, no additional provincial permits or approvals are required.

In subsection 4.2.2.3, CN stated that it ensures that all publicly available consultation materials are circulated to the Town of Milton and Halton Region and that it would continue to consult with these organizations throughout the EA process and the life of the Project. In subsection 4.3.2.4 CN committed to share the results of follow-up technical studies and monitoring programs with a local residents' group that had expressed interest in the Project and environmental protection.

In subsection 9.6 of the EIS, CN indicated that it would provide reports on follow-up and monitoring activities to regulators. CN did not indicate whether it would submit any such reports to the Government of Ontario, Halton Municipalities, Town of Milton, or Conservation Halton. CN did not indicate whether any such reports would be provided to Indigenous groups. Additionally, CN did not state whether any reports would be made publicly available, either on its website or elsewhere.

#### **Information Request:**

- a) Indicate with whom, other than regulators, CN commits to sharing information, what issues would be discussed in these reports and how frequently those reports will be shared.



b) *Specify what reports would be provided to Indigenous groups.*

**CN Response:**

a) *Indicate with whom, other than regulators, CN commits to sharing information, what issues would be discussed in these reports and how frequently those reports will be shared.*

Stakeholders will have the opportunity to access information regarding the Project during the EA process and after a decision is made, including follow-up and monitoring reports, which will be made publicly available through the Project's website. As stated in the EIS Section 9.0, the follow-up and monitoring programs are intended to verify the accuracy of predicted environmental effects, determine the effectiveness of any mitigation measures taken to eliminate, reduce or control the adverse environmental effects and to provide for adaptive management measures and contingency planning should environmental effects differ from predictions in the EIS or mitigation measures are not as effective as anticipated. CN has committed to sharing the results of these programs with the public (EIS Section 9.2).

While an appropriate method of communicating follow-up and monitoring results to the public will be developed in consultation with the appropriate agencies (EIS Section 9.2), CN anticipates that copies of the final follow-up and monitoring reports will be uploaded to the project website at the same time that such reports are submitted to the regulators.

Beyond the follow-up and monitoring programs, CN has also committed to share information regarding construction of the Project. CN has committed to a communication protocol whereby the local community, including municipalities and members of the public, will be kept informed of planned construction activities (EIS Appendix E.10, page 63; Attachment IR23, provided in response to CEAA IR23 (CEAR #72)). It is envisioned that this communication will include providing website updates, newspaper ads, and periodic notification to nearby residents by mail. The website will be periodically updated and available to the general public. CN will ensure that this notification includes information for individuals to contact CN regarding questions or concerns (i.e., an information centre, a 1-800 phone line, email address or website).

Further, prior to construction, appropriate notifications will be provided in accordance with Section 8(1) of the *Railway Safety Act*, specifically in regard to the Notice of Railway Works Regulations (SOR/91-103). This provides notice within 60 days before commencement of proposed works and will include:

- a drawing showing the location of the proposed works;
- a description of the proposed works with general plans, including elevations of proposed structures;
- a description of any impact that the proposed works may have on the safety of persons and property; and,
- the proposed date of commencement and the projected time for completion of the proposed works (Section 4, Notice of Railway Works Regulations (SOR/91-103)).

This information will be made publicly available through the Project's website.



b) Specify what reports would be provided to Indigenous groups.

As part of the Aboriginal engagement practices established for this Project, draft copies of the Stage 1-2 and Stage 3 archaeological assessment reports were provided to Aboriginal communities. Comments received from the Aboriginal communities were then addressed in updated versions of the reports which were then submitted to the MTCs for review and inclusion in the Ontario Public Record of Archaeological Reports. Additional information about the archaeological report review process is detailed in response to IR4.32, IR4.37 and **IR5.13**.

Once completed, draft copies of the Stage 4 archaeological reports will also be provided to the Aboriginal communities for review. Any comments received as a result of the reviews will be addressed in updated reports that will then be submitted to the MTCs for review and inclusion in the Ontario Public Record of Archaeological Reports. Final copies of all archaeological reports will be made available to Aboriginal communities to add to their community libraries and records.

Aboriginal communities will also be provided notification of planned construction activities and the follow-up and monitoring reports described in part a), including the final construction monitoring and post-construction monitoring reports, that will be uploaded to the project website.

## ENVIRONMENTAL MANAGEMENT

### IR5.17 Environmental management plans

#### **Rationale:**

*In Table 9.2 of the EIS, CN introduced its Environmental Management Plan components: environmental protection plan; emergency response plan; soil management plan; stormwater management plan; erosion and sedimentation control plan; and planting plan.*

*CN stated in subsection 1.5.3 of the EIS that the environmental protection plan would include: soils handling and storage; waste management; noise and vibration management; air quality, dust and greenhouse gas management; traffic management; spill prevention and contingency; flood and excessive flow contingency; fire suppression contingency; historical resources or traditional land use discovery; erosion control; and engagement with public, stakeholder, and Aboriginal communities.*

*In Section 9.8, CN stated that preliminary plans were prepared in support of the EIS in Appendix E and would be developed and revised as necessary as the Project progresses. CN has not provided a preliminary environmental protection plan in Appendix E.*

*In Table 9.2, CN stated that a site-specific emergency response plan would be developed for the construction phase to establish emergency response procedures that protect human health, the environment, and the Project. CN noted that its existing operations emergency response plan would be updated as necessary to include the Project. CN did not provide a preliminary emergency response plan in Appendix E.*



The planting plan is described in subsection 6.1.6 of Appendix E.2 and drawings L-300, L-500 and L-501 depict the planting plans. Although general descriptions of the soil management plan and the erosion and sedimentation control plan were provided by CN in Table 9.2, neither of those preliminary plans were provided in Appendix E.

In Appendix B of Appendix E.15, CN presented its stormwater management strategy, and therefore, at this time a preliminary stormwater management plan is not required.

**Information Request:**

a) Provide a preliminary environmental protection plan, emergency response plan, soil management plan, and an erosion and sedimentation control plan. Alternatively, provide examples of plans that CN has implemented at other similar facilities, with an indication of how a plan might be tailored for the context of the Milton Logistics Hub project.

If applicable, in developing the response to this information request, consider responses to other information requests in this package, namely information request 5.24 (Emergency Response).

**CN Response:**

Detailed design for the Project is not yet underway; thus, finalizing fully fleshed out preliminary plans would be premature. We have, however, in response to this IR, provided preliminary plan outlines for these 4 components of the Environmental Management Plan (see EIS Section 9.2, Table 9.2):

**Environmental Protection Plan**

The purpose of the EPP is to outline the proposed environmental protection measures and commitments to be carried out by CN, their contractor and subcontractors, during construction and operation to avoid or reduce potential effects. **Attachment IR5.17-1: Draft Environmental Protection Plan Outline** provides the structure of the EPP that will be developed, as well as the individual site and event-specific management and contingency plans that will be part of the EPP. The EPP will include, at a minimum, mitigation measures committed to in the EIS and supplemental information requests and subsequent EA process, as well as any monitoring and reporting requirements that are imposed. The EPP will also define roles and responsibilities and reporting protocols both internal and to regulatory agencies as required.

Included as attachments to the EPP will be a number of management plans. Among the management plans will be the emergency response plan, soil management plan, and the erosion and sediment control plan. The purpose of these management plans is to establish objectives and targets to drive continuous improvement in environmental performance. Each plan is briefly described below.

**Emergency Response Plan**

The purpose of the CN Milton Logistics Hub Emergency Response Plan will be to establish an organizational structure and procedures for response to emergencies during construction, by building on the following existing CN Emergency Response Protocols:

- Clearly communicate the nature of the emergency through established appropriate channels;



- Organize appropriate response to emergencies in an efficient manner;
- Preserve safety of the public, workers and the environment;
- Protect Project equipment and infrastructure (where it is safe to do so); and,
- Report emergencies to appropriate bodies (senior management, agencies, local response authorities) in a timely and appropriate manner.

CN's existing operations ERP will be updated as necessary to include the Milton Logistics Hub. **Attachment IR5.17-2: Draft Milton Logistics Hub Emergency Response Plan Outline** provides the structure of the plan that will be developed and refined during detailed design to be used during construction (further discussed in response to **IR5.24**).

### **Soil Management Plan**

The purpose of the Soil Management Plan during construction is to:

- Retain and preserve suitable soil for use in Project reclamation/restoration; and,
- Identify and manage soil impacted by existing or historical anthropogenic activities that require removal to allow development of the Project.

**Attachment IR5.17-3: Draft Soil Management Plan Outline** provides the proposed structure of the plan that will be developed by the contractor during detailed design, with input and oversight by CN.

### **Erosion and Sediment Control Plan**

The purpose of the Erosion and Sediment Control Plan is to provide site specific measures and Best Management Practices to minimize site erosion and protect watercourses and other sensitive receptors from sedimentation from erosion during construction of the Project. **Attachment IR5.17-4: Draft Erosion and Sediment Control Plan Outline** provides the proposed structure of the plan that will be developed by the contractor during detailed design, with input and oversight by CN.

## **IR5.18 CN's Environmental Guidelines for Railway Construction and Maintenance**

**Rationale:** *In subsection 9.7.2 of the EIS, CN stated that it has internal guidelines, plans and other documentation to guide construction, manage environmental effects and ensure the safety of employees, the public and property, including the Environmental Guidelines for Railway Construction and Maintenance.*

*CN also noted that this document informed the implementation of the commitments, mitigation, monitoring and design components and activities associated with the Project.*

*If CN intends to rely on these guidelines, the Review Panel requires additional details about them and how they are specifically applicable to the Milton Logistics Hub project.*

**Information Request:**

- a) *Provide a summary of CN's Environmental Guidelines for Railway Construction and Maintenance.*
- b) *Provide details on how this document has determined and informed the implementation of the commitments, mitigation, monitoring and design components and activities CN has proposed for the Project. Include any mitigation and monitoring that CN commits to implementing in the consolidated table of mitigation measures requested in information request 5.1 (Consolidated table of mitigation measures and proponent commitments).*

**CN Response:**

- a) *Provide a summary of CN's Environmental Guidelines for Railway Construction and Maintenance.*

The *Environmental Guidelines for Railway Construction and Maintenance* (CN 2002) (the Guidelines) were prepared to assist CN Engineering managers, supervisors and contractors to manage maintenance activities and construction projects under their direction with minimum impact to the surrounding environment. The document is a compilation of typical environmental management best practices from various jurisdictions in Canada, including practices from federal and provincial agencies, industry associations, railway experience and international sources. The principal objectives of these Guidelines included:

- Increase awareness among CN employees, consultants and contractors regarding environmental concerns associated with railway construction and maintenance;
- Provide standard best management practices and mitigation measures that could be considered in the development of railway construction and maintenance projects; and,
- Assist CN personnel, consultants and contractors in complying with protective environmental standards.

The Guidelines were developed to assist in the development of contractor bid documents and company work plans in the context of the environment for consideration when developing a specific project. The document is now dated and, newer, more applicable best management practices current to today's standard were applied to the development of the Project.

- b) *Provide details on how this document has determined and informed the implementation of the commitments, mitigation, monitoring and design components and activities CN has proposed for the Project. Include any mitigation and monitoring that CN commits to implementing in the consolidated table of mitigation measures requested in information request 5.1 (Consolidated table of mitigation measures and proponent commitments).*

The Guidelines referred to in subsection 9.7.2 of the EIS was one of several sources CN considered in planning for the construction of the Project. As a result of the extensive planning that has been carried out and continues, CN will be putting in place Project specific mitigation measures and will not be relying on the Guidelines. All the planning tools and documents CN intends to rely on have been included in the EIS or provided as part of the IR responses.



## REFERENCES

- AMEC. 2013a. Sixteen Mile Creek, Areas 2 and 7 Subwatershed Update Study (SUS) – Town of Milton, Final Draft (March 2013).
- AMEC. 2013b. Milton Urban Expansion Conceptual Fisheries Compensation Plan, Boyne Survey Area "Milton Phase 3", Final Draft (March 2013). BCWLAP. 2004. *Standards and Best Practices for Instream Works*. Ecosystem Standards and Planning Biodiversity Branch. Victoria, B.C. Available online at: <http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsdpsmarch2004.pdf>.
- Bowley, P. (2015). Farm Forestry in Agricultural Southern Ontario, ca. 1850-1940: Evolving Strategies in the Management and Conservation of Forests, Soils and Water on Private Lands. *Scientia Canadensis*, 38(1), 22–49. doi:10.7202/1036041ar
- Canadian Cancer Society 2018. Available online at: <http://www.cancer.ca/en/cancer-information/cancer-101/cancer-statistics-at-a-glance/?region=qc>.
- CEAA (Canadian Environmental Assessment Agency). 2015. Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archeological, Paleontological or Architectural Significance under the Canadian Environmental Assessment Act, 2012.
- CH (Conservation Halton). 2002. *Bronte Creek Watershed Study*.
- Cooper, C. 1982. *The Narrow Gauge For Us – The story of the Toronto and Nipissing Railway*. Boston Mills Press, Erin, Ontario.
- COSEWIC. 2016. COSEWIC assessment and status report on the Monarch *Danaus plexippus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 59 pp. Available online at: <http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1>.
- COSSARO. 2009. Committee on the Status of Species at Risk in Ontario Candidate Species at Risk Evaluation Form for Monarch (*Danaus plexippus*). Assessed November 2009.
- Decady, Y., and L. Greenberg. 2014. Ninety years of change in life expectancy, Health at a Glance. Statistics Canada Catalogue no. 82-624-X.
- Dillon Consulting Limited in Association with GHD Inc. and Aecom. 2011b. The Road to Change: Halton Region Transportation Master Plan 2031 – Appendix F4: Goods Movement. Prepared for Halton Region. Last accessed July 22, 2015. Available online at: <http://www.halton.ca/common/pages/UserFile.aspx?fileId=68540>.
- Environmental Canada. Last accessed March 21, 2018. Available online at: <https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife/mandate-cosewic.html>.
- Garstang, R.H. 1986 - Model for Artificial Night Sky Illumination, Publication of the Astronomical Society of the Pacific, March 1986.

- Halton Region. 2014a. *Regional Official Plan (ROP) Documents*. Last accessed April 9, 2018. Available online at: <http://www.halton.ca/cms/One.aspx?portalId=8310&pageId=115808>.
- Health Canada. 2012. *Federal Contaminated Site Risk Assessment in Canada Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0*.
- Hemson Consulting Ltd. 2013. *Greater Golden Horseshoe Growth Forecasts to 2041: Technical Report* (November 2012). Last accessed October 6, 2015 at: <http://www.hemson.com/downloads/HEMSON%20%20Greater%20Golden%20Horseshoe%20%20Growth%20Forecasts%20to%202041%20%20Technical%20Report%20Addendum%200ad%20Rev.%20Appendix%20B%20-%20Jun2013.pdf>
- Jameson, A. B. 1838. *Winter Studies and Summer Rambles in Canada*. New Canadian Library. Saunders and Otley, London.
- Kilgour and Stanfield. 2006. *Hindcasting Reference Conditions in Streams*, published in *American Fisheries Society Symposium 48, Landscape Influences on Stream Habitats and Biological Assemblages*
- Lamb, K. 1998. P.L., *Inventor of the Robertson Screw*. Milton Historical Society, Milton, Ontario.
- Land Information Ontario (LIO). 2015. *Digital mapping of natural heritage features*. Available online at: <http://www.MNRF.gov.on.ca/en/business/lio/index.html>. Accessed May 2015.
- Longcore T. and P, Smith. 2013. *Quantifying Human-related Mortality of Birds in Canada*. *Avian Conservation & Ecology*. 8(2): 1. Available online at: <https://www.ace-eco.org/issues/view.php?sf=4>
- Milton Historical Society. Last accessed March 21, 2018. Available online at: <http://www.miltonhistoricalsociety.ca/about-us/the-town-of-milton/>
- Ontario Agricultural Commission. 1881. *Appendix B*. Vol. II. C. Blackett Robinson, Toronto, Ontario.
- Puric-Mladenovic, D. *Pre-settlement Vegetation Mapping for the Greater Toronto Area, including the Regions of Hamilton, Halton, Peel and York and the Credit Valley Watershed*. Faculty of Forestry, University of Toronto, January 2011.
- Regional Municipality of Halton. 2015. *Interim Office Consolidation of the Regional Official Plan*. September 28, 2015.
- Strickland, S. 1853. *Twenty-seven years in Canada West; or the experience of an early settler*. Richard Bentley, London.
- Town of Milton. 2017. *Report No. PD-030-17: Milton Education Village Secondary Plan*. Prepared by Barbara Koopmans, Commissioner, Planning and Development and Linda Leeds, Deputy CAO/CFO. Available online at: <https://www.milton.ca/MeetingDocuments/Council/agendas2017/rpts2017/PD-030-17%20MEV%20Report.pdf>. Accessed February 1, 2018.

Town of Milton. 2018a. Milton Education Village Secondary Plan. Available online at: <http://www.milton.ca/en/build/MEVSecondaryPlan.asp>. Accessed February 1, 2018.

Town of Milton. 2018b. Milton Education Village: Ontario Invites Proposals for a University in Milton. Available online at: <https://www.milton.ca/en/townhall/miltoneducationvillage.asp>. Accessed April 24, 2018.

Town of Milton. 2018c. Milton Education Village Community Meeting, January 31, 2018. Available online at: <https://www.milton.ca/en/build/resources/Open-House-presentation.pdf>. Accessed March 19, 2018.

Town of Milton. 2018d. Derry Green Corporate Business Park. Available online at: <https://www.milton.ca/en/townhall/businesspark2.asp>. Accessed April 24, 2018.

Town of Milton. 2018e. South East Milton Urban Expansion Area. Available online at: <https://www.milton.ca/en/build/SouthEastMilton.asp>. Accessed April 24, 2018.

Walker and Miles. 1877. *Illustrated Historical Atlas of the County of Halton, Ont.* Miles and Company, Toronto, Ontario.



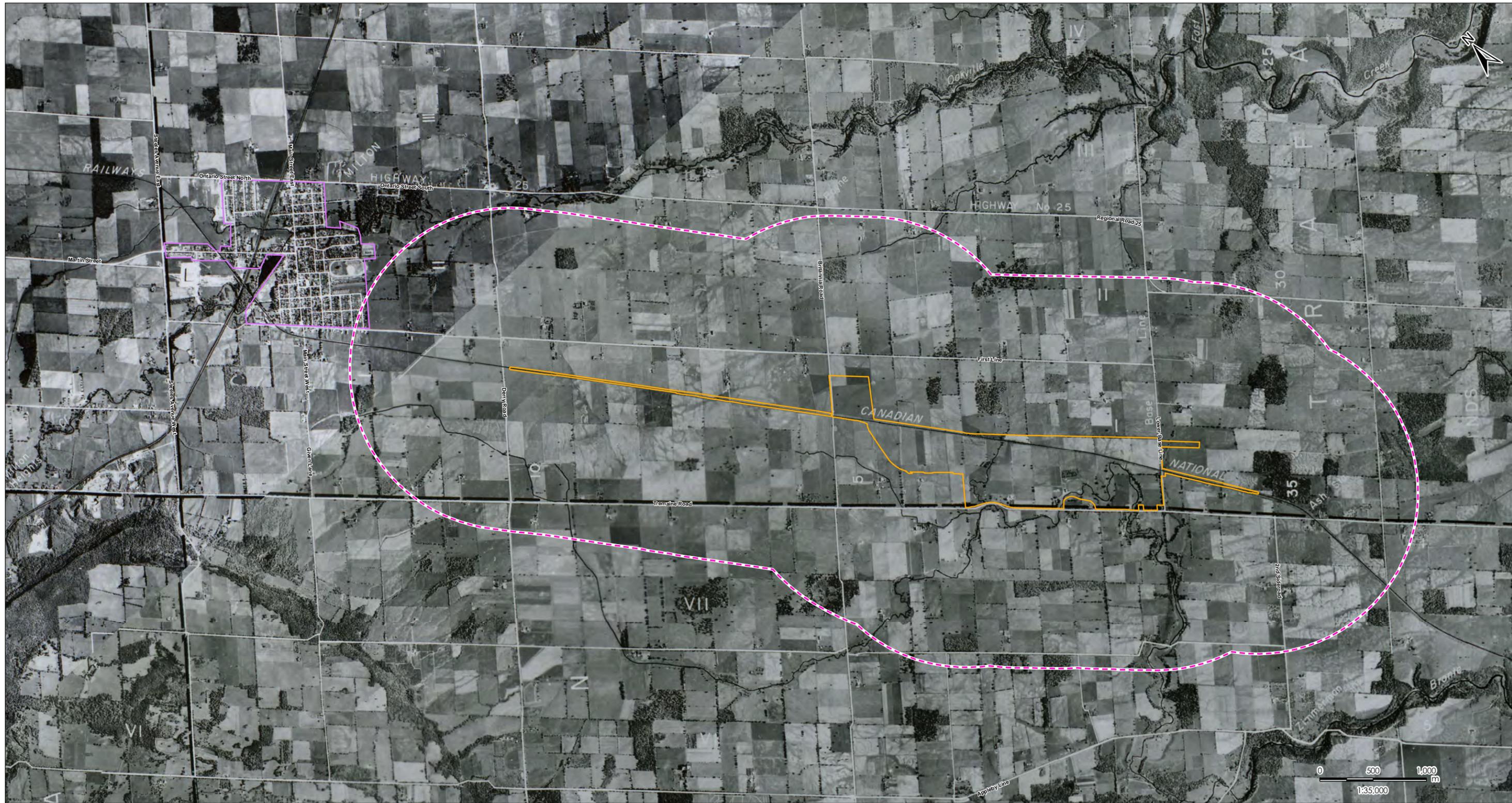
May 18, 2018

**ATTACHMENT IR5.2-1  
HISTORIC MAP OF THE TOWN OF  
MILTON, CIRCA 1954**





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 Revised: 2018-03-27 By: pwoersell

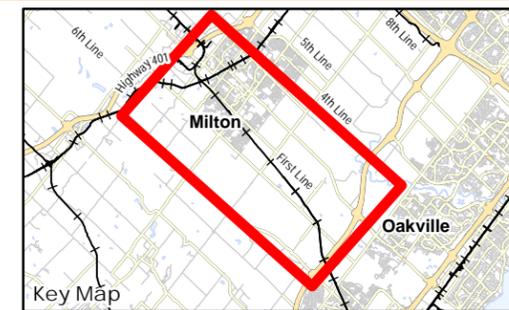


**Legend**

- Project Development Area
- Land and Resource Use Local Assessment Area
- Town of Milton Urban Boundary (approximate)

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Historic airphoto source: The Southern part of the Province of Ontario. Province of Ontario, Dept. of Lands and Forests, Surveys and Engineering Division, 1954. Published by Hunting Survey Corporation Limited, accessed through the University of Toronto Map and Data Library, 2018.



Client/Project  
 Canadian National Railway  
 Milton Logistics Hub

Figure No.  
 IR 5.2-1

Title  
 Historic Map of the Town of Milton,  
 circa 1954



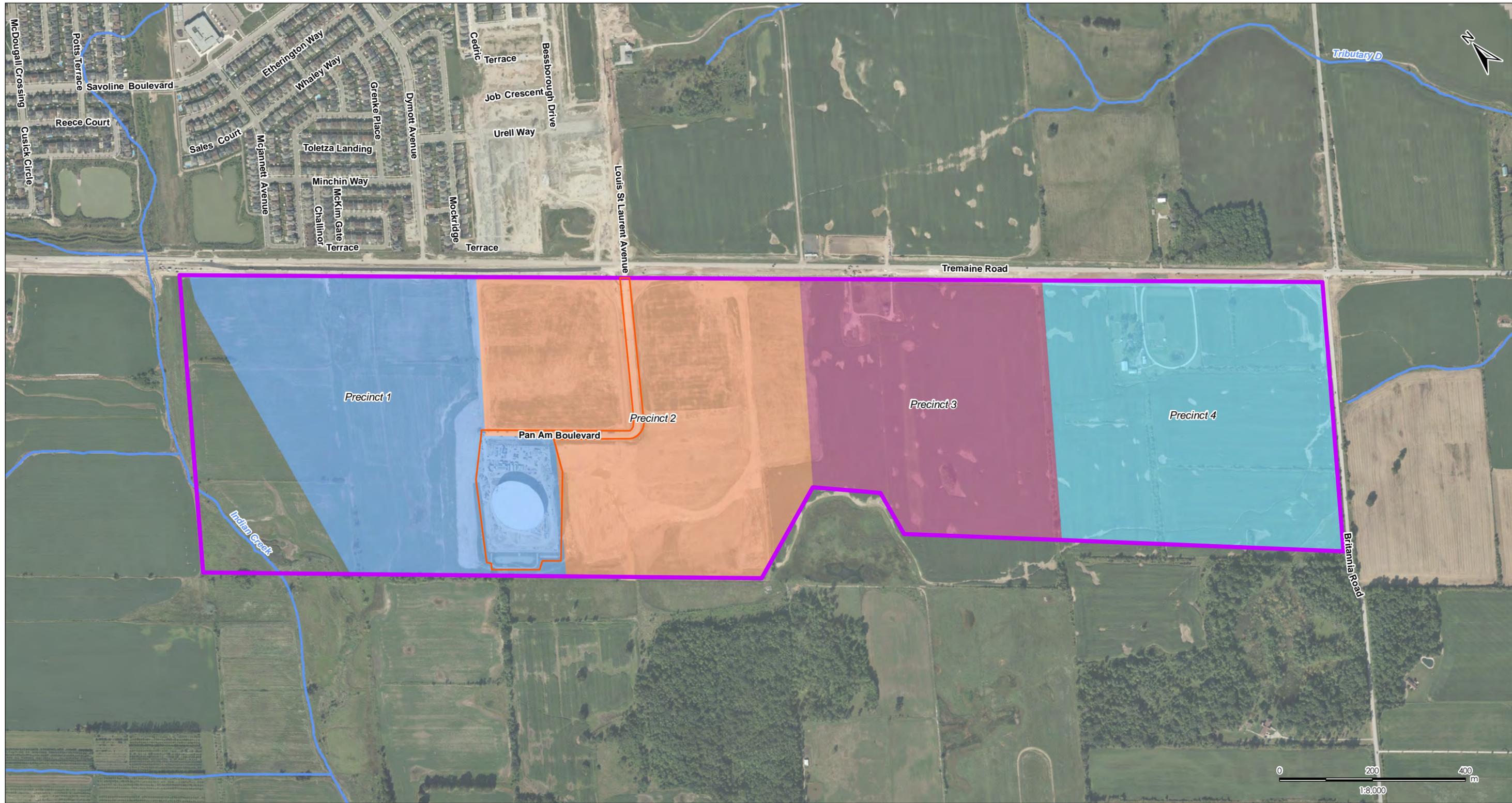
May 18, 2018

**ATTACHMENT IR5.3-1  
CONCEPTUAL PLANS FOR THE MILTON  
EDUCATION VILLAGE**





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 Revised: 2018-03-23 By: pwoersell



- Legend**
- Watercourse
  - Velodrome
  - Milton Education Village 4
  - Study Area
  - Precinct 1
  - Precinct 2
  - Precinct 3
  - Precinct 4

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2018. Site layout: July 10, 2015.
3. Orthoimagery © First Base Solutions, 2018. Imagery taken in 2014.
4. Milton Education Village Community Meeting, January 31, 2018 (Town of Milton, 2018c).



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 Canadian National Railway  
 Milton Logistics Hub

Figure No.  
 IR 5.3-1

Title  
 Milton Education Village



**ATTACHMENT IR5.3-2  
PROJECTS CONSIDERED FOR  
CUMULATIVE ASSESSMENT (REVISED)**









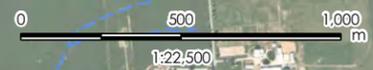
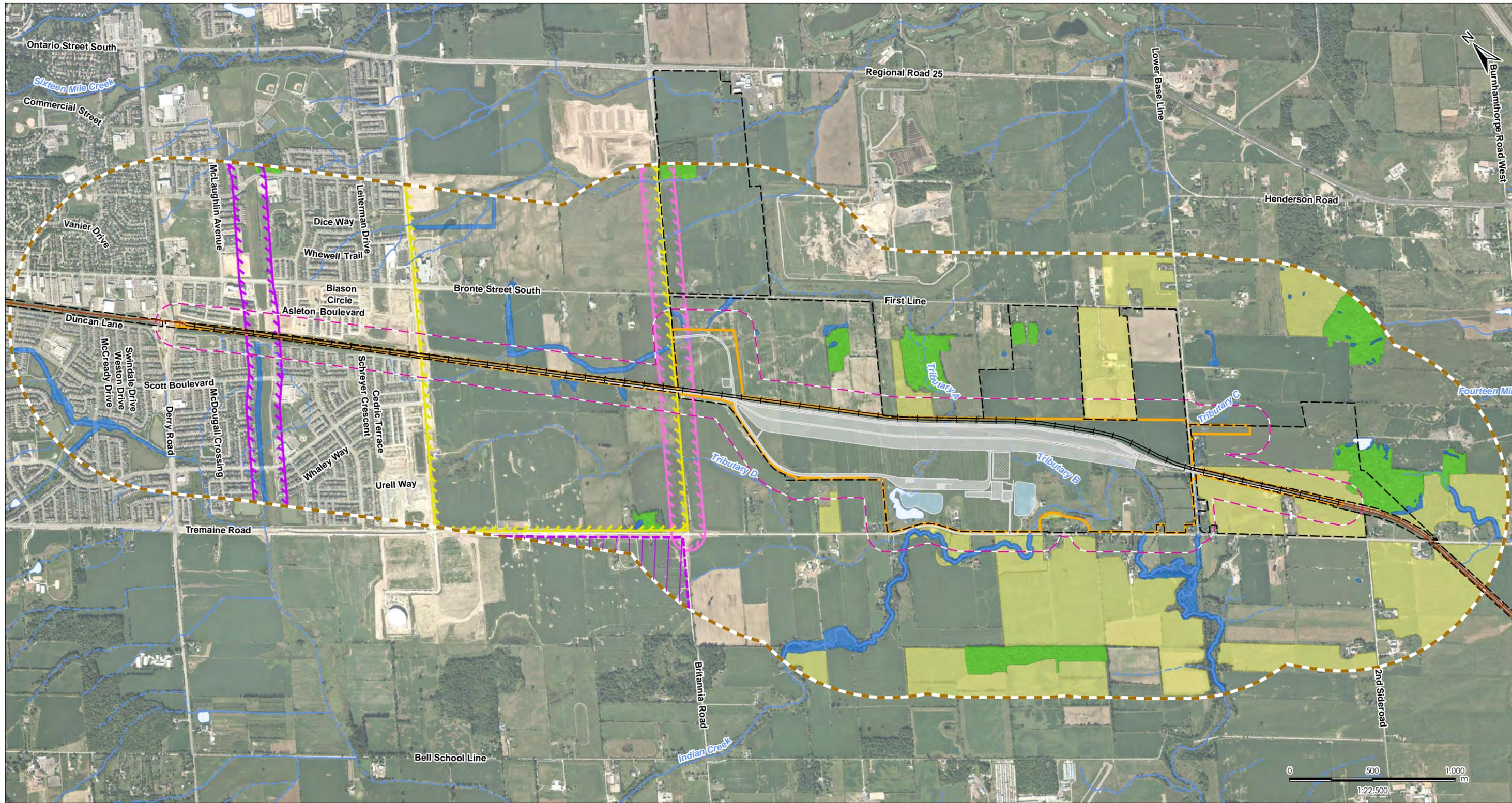
May 18, 2018

**ATTACHMENT IR5.7-1  
MIGRATORY BIRD HABITAT WITHIN THE  
RAA**





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 Revised: 2018-03-23 By: pworesell



**Legend**

- |                                |  |                                       |
|--------------------------------|--|---------------------------------------|
| Project Development Area       | SWM Pond                               | Union Gas Hamilton-Milton Project     |
| Regional Assessment Area       | Permanent Stream                       | Milton Education Village Study Area   |
| Local Assessment Area          | Intermittent Stream                    | Migratory Bird Habitat outside of PDA |
| Existing Single Track Mainline | Waterbody                              | Grassland Migratory Bird Habitat      |
| Existing Double Track Mainline | Cumulative Effects Areas               | Wetland Migratory Bird Habitat        |
| Double Track - Mainline        | Boyne Planning District                | Woodland Migratory Bird Habitat       |
| Project Component              | Britannia Road Transportation Corridor |                                       |
| CN-Owned Property              |  |                                       |

**Notes**

- Coordinate System: NAD 1983 UTM Zone 17N
- Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017. Site layout: July 10, 2015.
- Orthoimagery © First Base Solutions, 2017. Imagery taken in 2014.



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Figure No.  
 IR 5.7-1

Title  
 Migratory Bird Habitat within the RAA

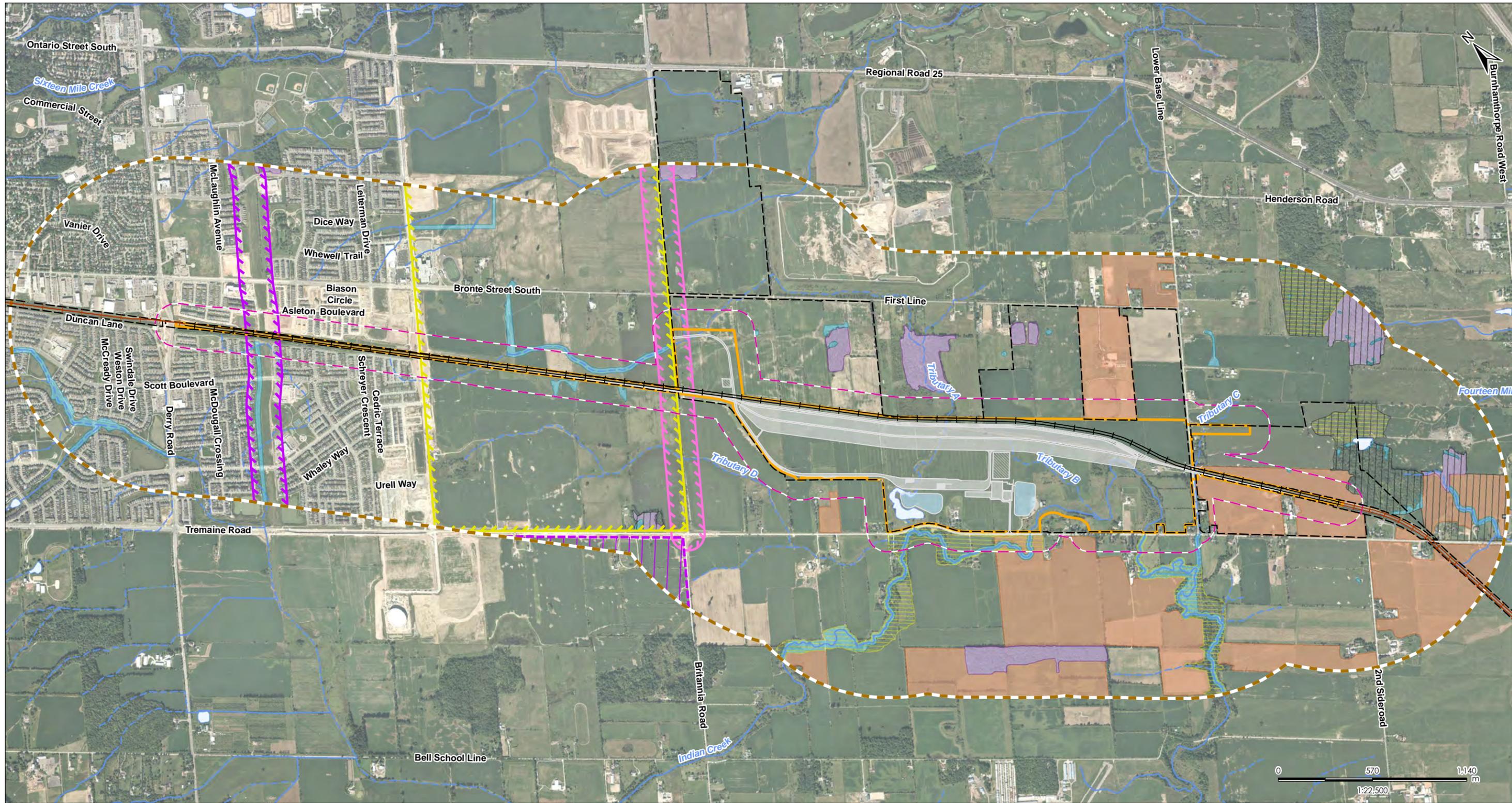


**ATTACHMENT IR5.8-1  
SPECIES AT RISK WITHIN THE RAA**





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 Revised: 2018-04-13 By: pworesell



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
  2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2017. Site layout: July 10, 2015.
  3. Orthoimagery © First Base Solutions, 2017. Imagery taken in 2014.

**Legend**

- |                                |  |   |                     |
|--------------------------------|--|---|---------------------|
| Project Development Area       | SWM Pond                               | Union Gas Hamilton-Milton Project             | Western Chorus Frog |
| Regional Assessment Area       | Permanent Stream                       | Milton Education Village Study Area           |                     |
| Local Assessment Area          | Intermittent Stream                    | <b>Species at Risk Habitat outside of PDA</b> |                     |
| Existing Single Track Mainline | Waterbody                              | Bobolink/Eastern Meadowlark Breeding Habitat  |                     |
| Existing Double Track Mainline | <b>Cumulative Effects Areas</b>        |   |                     |
| Double Track - Mainline        | Boyne Planning District                | Little Brown Myotis/Eastern Wood-Pewee        |                     |
| Project Component              | Britannia Road Transportation Corridor | Monarch Butterfly Habitat                     |                     |
| CN-Owned Property              |  | Snapping Turtle Habitat                       |                     |



Client/Project  
 Canadian National Railway  
 Milton Logistics Hub

Figure No.  
**IR 5.8-1**  
 Title  
**Species at Risk within the RAA**



May 18, 2018

**ATTACHMENT IR5.17-1  
DRAFT ENVIRONMENTAL PROTECTION  
PLAN OUTLINE**





## **ATTACHMENT IR5.17-1: DRAFT ENVIRONMENTAL PROTECTION PLAN OUTLINE**

### **1.0 INTRODUCTION**

The Environmental Protection Plan (EPP) will outline the proposed mitigation measures and commitments to be undertaken by CN, its contractors and subcontractors, during construction to avoid or reduce potential adverse environmental effects. The EPP will form part of the contract document with the successful construction contractor. The EPP will include best management practices (BMPs) and specific mitigation measures and commitments made by CN through regulatory approval. Proposed section headings include:

- 1.1 Project Summary
- 1.2 Project Schedule
- 1.3 Objectives and Methodology
- 1.4 Regulatory Permits/Approvals

### **2.0 ENVIRONMENTAL PROTECTION PLAN ORGANIZATION**

The EPP applies to all lands within the Project Development Area, including the construction area, temporary workspace, temporary access roads, staging areas, facility sites, construction yards and storage areas.

Environmental protection measures are identified under Section 7.0 in accordance with the progression of construction activities and are intended to be read in conjunction with the detailed designs to be developed for the Project.

This section of the EPP will provide an understanding of the general environmental setting of the Project, extent and limitations of the EPP, roles and responsibilities, specific or unique environmental protection measures of the Project, and general sequences of construction for the Project. Proposed section headings include:

- 2.1 EPP Organization
- 2.2 Roles and Responsibilities
- 2.2 Environmental Setting
- 2.3 Extent and Limits of the EPP
- 2.4 Project Schedule

### **3.0 ENVIRONMENTAL COMPLIANCE**

Environmental compliance is facilitated through sharing of information, providing environmental orientations/training, hiring qualified staff, clearly identifying mitigation measures, and providing onsite inspection of activities through a pro-active and adaptive management program.

This section of the EPP will describe compliance processes and objectives of the mitigation measures to ensure that:

- Relevant environmental requirements, approved environmental protection measures, and approved measures are known and consistently applied;
- Processes are in-place that allow access to Project environmental information to aid in decision making at the field level; and,

## **ATTACHMENT IR5.17-1: DRAFT ENVIRONMENTAL PROTECTION PLAN OUTLINE**

- Environmental Monitors assigned to the Project are qualified and properly trained.

### **4.0 NOTIFICATION OF CONCERNED PARTIES**

Notification of the construction schedule and timing of specific construction activities will facilitate awareness of upcoming activities and allow agencies and other stakeholders to plan as appropriate for construction activities in their area.

This section of the EPP will describe the requirements for notification and who will be notified and the entity responsible for completing that notification. The objectives of the notification measures are to ensure:

- interruptions to other land use activities are minimized during construction of the Project;
- affected stakeholders are aware of Project activities; and,
- relevant agencies' personnel are kept informed throughout construction.

### **5.0 PRE-CONSTRUCTION MEASURES**

This section of the EPP will describe the measures that will be implemented by CN's Contractor(s) and subcontractor(s) before the initiation of any ground disturbance activities.

The objectives of the pre-construction measures are to ensure:

- all resources are properly identified and marked in the field before the initiation of ground disturbance to avoid or minimize potential Project effects;
- the Construction area is properly delineated to prevent inadvertent trespass; and,
- all access to and from the work sites are properly marked.

### **6.0 RESOURCE-SPECIFIC PROTECTION AND MANAGEMENT MEASURES**

This section of the EPP will describe the specific environmental protection measures that will be used on the Project to protect identified sensitive environmental features. Reference will be made to the consolidated list of mitigation measures and other CN commitments, which will be appended as an attachment to this Plan.

The objective of these environmental protection measures is to identify and protect biophysical and cultural resources identified in the EIS, by Aboriginal communities, and agencies through the permitting process.

### **7.0 CONSTRUCTION**

This section of the EPP will describe general environmental protection measures to be considered throughout Project construction, including survey and utility locates, clearing and disposal, topsoil salvage and grading, watercourse realignments and crossing installation, clean-up, and waste management. Proposed section headings include:

## **ATTACHMENT IR5.17-1: DRAFT ENVIRONMENTAL PROTECTION PLAN OUTLINE**

- 7.1 General Environmental Protection Measures
- 7.2 Survey and Locates
- 7.3 Clearing and Disposal
- 7.4 Topsoil Salvage and Grading
- 7.5 Construction Activities
- 7.6 Watercourse Crossings and Realignment
- 7.7 Restoration and Enhancement Measures
- 7.8 Clean-Up
- 7.9 Waste Management

### **8.0 FINAL CLEAN-UP AND RESTORATION**

This section of the EPP will describe the final clean-up and restoration measures to be implemented to return the construction area(s) where applicable to a condition similar to pre-construction. The objectives of these mitigation measures are to:

- restore and stabilize disturbed surfaces;
- implement erosion and sediment control measures until sites are stabilized; and,
- finalize proposed restoration and enhancement measures.

### **9.0 POST-CONSTRUCTION REPORTING**

Following construction of the Project, CN will complete a Post Construction Report that summarizes the environmental compliance with the EPP.

Proposed section headings include:

- 9.1 Introduction
- 9.2 Objective
- 9.3 Monitoring Requirements
- 9.4 Results

### **10.0 REFERENCES**

### **11.0 SIGN-OFF SHEET**

## ATTACHMENT IR5.17-1: DRAFT ENVIRONMENTAL PROTECTION PLAN OUTLINE

### LIST OF APPENDICES

#### **Appendix A Environmental Alignment Sheets**

The Environmental Alignment Sheets will be prepared by the CN Environment Team to identify on an air photo mosaic base the locations of VCs that will require specific mitigation measures as well as a reference as to where details on these mitigation measures can be found.

#### **Appendix B Management Plans, Mitigation, Contingency Plans and Procedures**

##### B.1 Adverse Weather, Flooding and Excessive Flow And Watercourse / Wetland Siltation Prevention

This appendix will detail the erosion mitigation and contingency measures to be implemented to minimize watercourse and wetland sedimentation attributed to periods of extreme precipitation and flooding during construction and post-construction in the event of extreme precipitation during construction and post-construction or if excessive flow or flooding occur.

##### B.2 Weeds

This appendix will detail the mitigation and contingency measures to be implemented to prevent the introduction and spread of non-native plants and weeds and to eliminate or control them.

##### B.3 Wet / Thawed Soils

This appendix will detail the mitigation and contingency measures to be implemented to ensure soil productivity is maintained when wet or thawing soils to be used for reclamation are evident on the construction area.

##### B.4 Air Quality and Dust Control

This appendix will detail the mitigation and contingency measures to be implemented to comply with applicable air quality requirements for relevant criteria air contaminants, hazardous air pollutants, greenhouse gases and dust during construction, and to limit vehicle emissions and road dust to the extent feasible to reduce impacts on air quality.

##### B.5 Noise and Vibration

This appendix will detail the mitigation and contingency measures to be implemented to comply with applicable regulations and guidelines for noise during construction, and to reduce construction-related noise to the extent feasible near receptors. This appendix will also provide details of the mitigation, monitoring and contingency measures to be implemented to minimize the potential for damage to structures caused by construction vibration.

##### B.6 Wildlife Encounters

This appendix will detail the mitigation and contingency measures to be implemented in the event of an encounter with wildlife during the construction phase of the Project, either at the construction site or on the commute to and from the construction site.

##### B.7 Archaeological and Heritage "Chance Find"

This appendix will detail the mitigation and contingency measures to be implemented to identify and preserve previously unknown archaeological or heritage resources that may be encountered during construction activities such as grading, topsoil salvage and excavations.

##### B.8 Spills

## **ATTACHMENT IR5.17-1: DRAFT ENVIRONMENTAL PROTECTION PLAN OUTLINE**

This appendix will detail the mitigation and contingency measures to be implemented to prevent spills from occurring during construction and the steps to be taken if a spill of hazardous materials occurs.

### **B.9 Suspect / Contaminated Soil**

This appendix will detail the mitigation and contingency measures to be implemented in the event contaminated material is encountered during construction..

### **B.10 Water Well Monitoring**

This appendix will detail the measures to be implemented if construction activities may potentially disrupt groundwater flow into neighbouring water wells.

### **B.11 Water Quality Monitoring**

This appendix will detail the mitigation and contingency measures to be implemented in the event water quality monitoring detects sediment exceedances resulting from Construction.

## **Appendix C Typical Drawings**

## **Appendix D DFO Measures to Avoid Causing Serious Harm to Fish and Fish Habitat**

## **Appendix E Requirements For the Project**

## **Appendix F Emergency Contacts**

## **Appendix G Contacts**



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**ATTACHMENT IR5.17-2  
DRAFT MILTON LOGISTICS HUB  
EMERGENCY RESPONSE PLAN OUTLINE**





## **ATTACHMENT IR5.17-2: DRAFT MILTON LOGISTICS HUB EMERGENCY RESPONSE PLAN OUTLINE**

### **1.0 Introduction**

The Milton Logistics Hub Emergency Response Plan will outline the organizational structure and procedures for response to emergencies during construction.

### **2.0 Project Summary**

### **3.0 Management and Monitoring Plan Purpose**

This section will describe the purposes of the ERP and establish performance objectives and targets. The overall purpose of the ERP is to establish structures and procedures for appropriate response to emergencies in an efficient manner. Proposed section headings include:

- 3.1 Purpose
- 3.2 Performance Objectives

### **4.0 Scope**

This section of the ERP will describe the area of the Project the ERP applies to during construction.

### **5.0 Planning**

This section of the ERP will outline the roles and responsibilities of all persons working for or on behalf of CN, including employees and contractors, so that all understand and have a role in the successful implementation of the ERP. It will also describe the regulatory and other relevant requirements. Proposed section headings include:

- 5.1 Organizational Roles and Responsibilities
- 5.2 General Emergency Response Roles and Responsibilities
- 5.3 Requirements

### **6.0 Support**

This section of the ERP will outline the required competencies, qualifications and training required for personnel involved in the execution of the ERP. This section will also outline documentation and communication protocols for internal and external parties. Proposed section headings include:

- 6.1 Competence, Training and Awareness
- 6.2 Communication
  - 6.2.1 Emergency Contact Point
  - 6.2.2 Communications Responsibilities
  - 6.2.3 Offsite Emergencies
  - 6.2.4 Public Warning and Evacuation
  - 6.2.5 Reporting

## **ATTACHMENT IR5.17-2: DRAFT MILTON LOGISTICS HUB EMERGENCY RESPONSE PLAN OUTLINE**

### **7.0 Implementation of Emergency Response Measures**

This section of the ERP will outline the procedures, processes and management practices to handle and respond to emergencies, including medical emergencies, evacuations, fires, spills, infrastructure failures and natural hazards. Proposed section headings include:

- 7.1 General Approach
- 7.2 Level of Urgency
- 7.3 Project First Aid Services
- 7.4 Medical Emergencies Resulting in Injuries or Fatalities
  - 7.4.1 Injury or Medical Emergency
  - 7.4.2 Fatalities
- 7.5 Missing Persons
  - 7.5.1 Low Urgency
  - 7.5.2 Medium Urgency
  - 7.5.3 High Urgency
- 7.6 Evacuations
  - 7.6.1 Incident Commander Responsibilities
  - 7.6.2 Personnel Responsibilities
- 7.7 Fires
  - 7.7.1 Designated Assembly Areas
- 7.8 Spills / Leaks
- 7.9 Infrastructure Failures
- 7.10 Natural Hazards
  - 7.10.1 Severe Weather Events
  - 7.10.2 Earthquakes
  - 7.10.3 Wildlife Incidents
- 7.11 Off-Site Emergencies

### **8.0 Monitoring, Evaluation and Reporting**

This section of the ERP will describe the protocols and practices to monitor progress in the implementation of the ERP. This section will also describe issues tracking and resolution as well as adaptive management and continual improvement of work practices and procedures associated with the ERP. Proposed section headings include:

- 8.1 Monitoring, Measurement, Analysis and Evaluation
- 8.2 Reporting
- 8.3 Continual Improvement

### **9.0 References**

### **10.0 Figures**

- 10.1 Site Map
- 10.2 Emergency Response Figure
- 10.3 Evacuation Plan figure (Routes and Muster Point)

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**ATTACHMENT IR5.17-3  
DRAFT SOIL MANAGEMENT PLAN  
OUTLINE**





## **ATTACHMENT IR5.17-3: DRAFT SOIL MANAGEMENT PLAN OUTLINE**

### **1.0 Introduction**

This section will describe CN's Soil Management Plan committed to minimizing environmental effects through the implementation of mitigation measures, monitoring and adaptive management during construction.

### **2.0 Project Summary**

### **3.0 Soil Management Plan Purpose**

This section will describe the purpose of the Soil Management Plan (SMP) during the construction phase, which is to:

- retain and preserve suitable soil for use in Project reclamation/rehabilitation; and
- identify and manage soil impacted by existing or historical anthropogenic activities that require removal to allow development of the Project.

This section will also describe the objectives and targets to be established to drive continuous improvement in environmental performance. Objectives are measurable (where practical), monitored, communicated, and updated as appropriate.

CN will establish the following performance objectives for the SMP that considers key Project interactions and compliance obligations:

- to utilize on-site material for the creation of berms;
- to preserve adequate volumes of topsoil for rehabilitation;
- meet the applicable regulations and guidelines when handling, treating, and disposing of contaminated soil or sediment.

Proposed section headings include:

- 3.1 Purpose
- 3.2 Performance Objectives

### **4.0 Scope**

This section will describe that the scope of the SMP applies to all areas within the Project Development Area that will undergo changes through construction to accommodate the advancement of the Project.

The SMP will apply to individuals working for or on behalf of CN, including employees and contractors, who have a role and/or accountability for the development, implementation, and maintenance of this plan.

### **5.0 Planning**

This section will describe the roles and responsibilities of all persons working for or on behalf of CN, including employees and contractors, who have a role in the successful implementation and

## **ATTACHMENT IR5.17-3: DRAFT SOIL MANAGEMENT PLAN OUTLINE**

maintenance of the SMP. These individuals typically include the Construction Manager, Environment Monitor, Environment Specialists or Technicians, and equipment operators.

These sections will also describe the regulatory, and other obligations, specific to the construction of the Project. Proposed section headings include:

- 5.1 Organizational Roles, Responsibilities and Authorities
- 5.2 Compliance Obligations

### **6.0 Support**

This section will describe the process to identify and quantify the areal extent and volumes of salvagable soils in the Project area. This section will also describe the required competencies, qualifications and training required for personnel involved in the execution of the SMP, as well as, the documentation and communication protocols for internal and external parties.

Proposed section headings include:

- 6.1 Identification/Inventory of Resources
  - 6.1.1 Estimation of Topsoil Material to Salvage
- 6.2 Competence, Training and Awareness
- 6.3 Internal and External Communication

### **7.0 Implementation of Mitigation Measures**

These sections will describe the procedures, processes and management practices to salvage, store and protect soils to be handled as a result of the construction of the Project. This also includes salvage, handling and transportation of soils that may be contaminated from historical activities or as a result of a spill during construction. Proposed section headings include:

- 7.1 General Approach
- 7.2 Soil Excavation and Salvage
  - 7.2.1 Excavation and Salvage of Soils
  - 7.2.2 Standard Excavation Management Practices
- 7.3 Handling and Storage of Soils
  - 7.3.1 General Handling and Storage of Soils
  - 7.3.2 Handling and Storage of Contaminated Soils
  - 7.3.3 Standard Erosion Management Practices (reference ESC Plan)

### **8.0 Monitoring, Evaluation and Reporting**

These sections will describe the protocols and practices to monitor progress, quality and daily activities. This section will also describe issues tracking and resolution as well as adaptive management and continual improvement of work practices and procedures associated with the SMP. Proposed section headings include:

- 8.1 Monitoring, Measurement, Analysis and Evaluation
- 8.2 Reporting
- 8.3 Continual Improvement

## **ATTACHMENT IR5.17-3: DRAFT SOIL MANAGEMENT PLAN OUTLINE**

### **9.0 References**

### **10.0 Figures**

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Table 6-1: Total Salvage Areas, Soil Condition, and Soil Series (ha)

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**ATTACHMENT IR5.17-4  
DRAFT EROSION AND SEDIMENT  
CONTROL PLAN OUTLINE**





## **ATTACHMENT IR5.17-4: DRAFT EROSION AND SEDIMENT CONTROL PLAN OUTLINE**

### **1.0 Introduction**

This section will describe that CN's Erosion and Sediment Control Plan is committed to minimizing environmental effects through the implementation of mitigation measures, monitoring and adaptive management during construction.

### **2.0 Erosion and Sediment Control Plan Purpose**

This section will describe the purpose of the Erosion and Sediment Control Plan (ESCP), which is to provide measures and Best Management Practices to minimize site erosion and protect watercourses from sedimentation during construction. This section will also describe the objectives and targets to be established to drive continuous improvement in environmental performance. Objectives are measurable (where possible), monitored, communicated, and updated as appropriate. CN will establish the following performance objectives for the ESCP that considers key Project interactions and compliance obligations:

- Prevent the uncontrolled release of sediment to natural watercourses;
- Compliance with applicable regulations and guidance; and
- Compliance with environmental monitoring criteria.

Proposed section headings include:

- 2.1 Purpose
- 2.2 Performance Objectives

### **3.0 Scope**

This section will describe that the scope of the ESCP applies to all areas within the Project Development Area that will undergo changes through construction

The ESCP will apply to individuals working for or on behalf of CN, including employees and contractors, who have a role and/or accountability for the development, implementation, and maintenance of this plan.

### **4.0 Planning**

This section will describe the roles and responsibilities of all persons working for or on behalf of CN, including employees and contractors, who have a role in the successful implementation and maintenance of the ESCP. These individuals typically include the Construction Manager, Environment Monitor, Environment Specialists or Technicians, and equipment operators. This section will also describe compliance obligations specific to the construction of the Project.

Proposed section headings include:

- 4.1 Organizational Roles and Responsibilities
- 4.2 Compliance Obligations

## **ATTACHMENT IR5.17-4: DRAFT EROSION AND SEDIMENT CONTROL PLAN OUTLINE**

### **5.0 Support**

This section will describe the required competencies, qualifications and training required for personnel involved in the execution of the ESCP. Proposed section headings include:

- 5.1 Competence, Training and Awareness

### **6.0 Implementation of Mitigation Measures**

This section will describe the procedures, processes and management practices to stabilize soil and manage runoff from disturbed areas during construction of the Project. This section will also present the general approach and philosophies used to minimise erosion and to protect sensitive features, and will describe the mitigation measures to be put in place by design prior to the beginning of construction in those locations considered to be susceptible to erosion impacts.

This section will describe site-specific Best Management Practices (BMPs) and stabilization measures to be implemented at various works and locations as directed by the Environment Monitor. Practices chosen will vary according to site conditions, time of year, expected risk, substrate material or other site-specific factors. This section will also describes measures and contingencies to put in place to address rapidly evolving situations that could have the potential to impact sensitive features. Measures will be identified to minimize the potential for erosion and sedimentation resulting from unforeseen events, such as monitoring weather / precipitation and predicting major runoff events.

Proposed section headings include:

- 6.1 General Approach
- 6.2 Mitigation by Design
- 6.3 Best Management Practices
  - 6.3.1 Silt Fence
  - 6.3.2 Geotextile Mat
  - 6.3.3 Drainage Ditches
  - 6.3.4 Rock Check Dam
  - 6.3.5 Berms
  - 6.3.6 Sediment Trap
  - 6.3.7 Construction Mud Mats
  - 6.3.8 Erosion Control Blanket
  - 6.3.9 Re-Seeding/stabilization of Disturbed Areas
- 6.4 Treatment of Unforeseen Events

### **7.0 Monitoring, Evaluation and Reporting**

These sections will describe the protocols and practices to monitor progress, quality and daily activities. This section will also describe issues tracking and resolution as well as adaptive management and continual improvement of work practices and procedures associated with the ESCP. Proposed section headings include:

- 7.1 Monitoring, Measurement, Analysis and Evaluation
- 7.2 Reporting
- 7.3 Continual Improvement

## **ATTACHMENT IR5.17-4: DRAFT EROSION AND SEDIMENT CONTROL PLAN OUTLINE**

**9.0 References**

**10.0 Drawings**

