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May 18, 2016

Mr. Joseph Ronzio
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Canadian Environmental Assessment Agency
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**Re: Canadian National Railway Company
Response to CEAA Information Request 1 Received March 15, 2016 (CEAR File No. 80100)**

Dear Sir,

The Canadian National Railway Company (CN) is pleased to provide you with our responses to the *Requirements for Additional Information from Canadian National Railway Company for the Milton Logistics Hub Environmental Assessment* received on March 15, 2016 (under CEAR File No. 80100), 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).

The enclosed document entitled *CN Response to the Canadian Environmental Assessment Agency (CEAA) Information Request 1 Received – March 15, 2016* (May 18, 2016) is provided to address the comments and questions raised by CEAA.

This information does not change the assessment of effects or the results of the EIS, and still demonstrates that the Project is not likely to result in significant adverse environmental effects, including cumulative environment effects, provided that the proposed mitigation measures are implemented.

Please do not hesitate to contact me should you have any questions.

Yours truly,

<Original signed by>

Normand Pellerin
Assistant Vice-President Environment and Sustainability

**CN Response to the Canadian
Environmental Assessment Agency
(CEAA) Information Request 1 Received
– March 15, 2016**

Canadian National Railway Company (CN)
Milton Logistics Hub ("Project")
CEAR File No. 80100
Filed on December 7, 2015

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May 18, 2016

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ATTACHMENT IR2 – AMENDED EIS TABLES

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Attachment IR2 - Amended Table 6.25: Potential Project Environmental Interactions and Effects on Species at Risk Project Components and Physical Activities

Attachment IR2 - Amended Table 7.1: Summary of Environmental Effects Assessment

Attachment IR2 - Amended Table 10.1: Project Interactions with VCs

ATTACHMENT IR5 – CONCEPTUAL PROJECT SCHEDULE

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PRESENTATION OF THE EIS

IR1 – Concordance Table

CEAA Comment:

Rationale: The EIS Guidelines (Part 1, Section 4.4) require that the proponent include a table of concordance, which cross references the information presented in the Environmental Impact Statement (EIS) with the information requirements identified in the EIS Guidelines. A well referenced concordance table is essential given that the information included in the EIS is intended to meet the requirements of Canadian Environmental Assessment Act, 2012 (CEAA 2012) and other applicable federal legislation, and consists of a main report, appendices, technical reports, and other supplemental documents.

Table 1.2 lacks the referencing required to ensure reviewers do not miss critical information that appears throughout the various documents and reports. For example, the concordance table indicates that the information required by Part 2, Section 2 of the EIS Guidelines (Project Justification and Alternatives Considered) is presented in Chapter 2 of the EIS. However, a review of the EIS appendices shows that Appendix E.11, E.12 and Appendix F present a more complete discussion, including additional information related to project justification and alternatives considered (e.g., the potential economic and social benefits of the Project and the identification of alternative means of carrying out the Project).

Information Required: Provide a revised concordance table which comprehensively cross-references the information requirements identified in the EIS Guidelines with the information presented in the EIS and its appendices, including references to figures, graphs, tables, or charts. The revised concordance table is to identify specific document, section(s) and sub-section(s) of the EIS and its appendices in which information can be found.

CN Response:

A more comprehensive concordance table has been prepared (see **Attachment IR1 - Amended Concordance Table 1.2**), which includes cross-references from the relevant Environmental Impact Statement (EIS) sections.

The main body of the EIS has been structured to closely follow the Final EIS Guidelines, where section references in the EIS correlate to the EIS Guidelines. Cross-references are incorporated into the EIS to direct the reader to other relevant sections of the EIS or to the various technical appendices, figures or additional supplemental information.

CLARIFICATIONS

IR2 – Missing Information

CEAA Comment:

Rationale: Tables 6.21, 6.25 and 10.1 in the EIS are incomplete. These tables are missing information to indicate whether or not there is a potential interaction between a Project component or activity and a specific valued component.

EIS Table 7.1 provides a summary of the environmental effects assessment. This table is missing information to indicate whether or not archaeological and heritage resources interact with the operations phase of the Project.

Information Required: Provide revised versions of EIS tables 6.21, 6.25, 7.1, and 10.1 with the missing information added.

If there is a potential interaction between that Project activity and a valued component, provide an assessment of the effects of the Project on those specific valued components. Alternatively, if the information already exists in the EIS, indicate where it can be found.

CN Response:

Revised versions of Tables 6.21, 6.25, 7.1, and 10.1 have been prepared to clarify and address this comment (see **Attachment IR2 – Amended Tables 6.21, 6.25, 7.1 and 10.1**).

The blank cells in the original Tables 6.21, 6.25, 7.1 and 10.1 do not indicate missing information, but rather should instead be interpreted as a “-”, which indicates that “no interaction or associated environmental effects are anticipated; Further assessment is considered unnecessary.

In updating these tables, Table 6.25 and Table 10.1 have been revised to address transcription errors. These edits do not result in any substantive changes to the assessment of environmental effects or to the text of the EIS. The transcription error does not alter the results of the EIS.

IR3 – Accidents and Malfunctions

CEAA Comment:

Rationale: The EIS (Table 6.51) states that hazardous materials spill and traffic accidents at the entry points to the terminal were predicted to have no interactions with the human health valued component. However, Table 10.1 states that these two scenarios have been identified as resulting in changes to human health.

Likewise, Table 6.51 states that hazardous materials spill and traffic accidents at the entry points to the terminal were predicted to have interactions with the socio-economic valued component, while Table 10.1 indicates that there would be no interaction.

Information Required: Clarify the discrepancies between the information provided in Table 6.51 and that provided in Table 10.1 regarding the predicted interactions between hazardous materials spill and traffic accidents at the entry points to the terminal and the valued components (i) human health and (ii) socio-economics.

CN Response:

The potential interactions between the human health Valued Component (VC), the socio-economic conditions VC and spills of hazardous materials and traffic accidents at the entry points to the terminal are addressed in EIS Section 6.6.2 and Table 6.51. In preparing Table 10.1 of the EIS, a transcription error occurred. As noted in IR2, a revised Table 10.1 is attached (see

Attached IR2 – Amended Table 10.1), which reflects the potential interactions identified in Table 6.51.

PROJECT DESCRIPTION

IR4 – Project Components

CEAA Comment:

Rationale: *The EIS Guidelines (Part 2, Section 3.1) require the proponent to describe the Project by presenting the Project components; associated and ancillary works; and other characteristics including topsoil, gravel, sand, and construction material stockpiles (footprint, locations, volumes, development plans, and design criteria) that will assist in understanding the potential environmental effects.*

The EIS does not provide adequate information on the stockpiles on the Project site. Information on stockpile type, footprint, locations, volumes, development plans, and design criteria is required to understand potential environmental effects. For example, stormwater runoff from stockpiles could result in the deposit of deleterious substances into waters frequented by fish. The nature and likelihood of such effects would be influenced by the stockpile characteristics.

Information Required: *Provide footprint, locations, volumes, development plans and design criteria for topsoil, gravel, sand, and construction material stockpiles.*

CN Response:

A description of the known materials and volumes anticipated during construction is provided in EIS Section 3.3.9, with further description of activities associated with construction described in EIS Section 3.4.1.1 (site clearing and grading activities) and EIS Section 3.4.1.3 (terminal infrastructure). This information is based on conceptual design plans that will be refined and confirmed through detailed design and the contractor procurement processes.

Development plans will be refined to identify the footprint, locations, volumes of material and design criteria in association with the contractor and will reflect the mitigation measures proposed to minimize potential interactions between the Project and environment. For example, buffers along riparian areas will be established during grading and vegetation clearing activities, as discussed in EIS Section 6.5.1.9.5 (page 185) and Appendix G. Activities within these buffers will be restricted to disturbance associated with channel realignment, restoration and naturalization activities (section 6.5.1.9.5, page 185).

Based on conceptual plans for the Terminal the EIS provides the following information pertaining to the footprint, locations, volumes, development plans and design criteria for topsoil, gravel, sand and construction material stockpiles:

Topsoil

Location and Footprint – The location of topsoil material is generally described in EIS Section 3.3.8 (page 49) and EIS Section 3.3.9 (pages 49 to 50). All grading activities will occur within the PDA

(EIS Section 3.4.1.1, page 54), with excess material to be used to construct berms around the Terminal (EIS Section 3.3.8, page 49).

There will be minimal stockpiles of earth on-site in order to limit/avoid double handling of material. Topsoil will be stripped and stored on site to accommodate restoration of vegetative cover on berms, SWM ponds, and manicured grassed areas.

The footprint of topsoil stockpiles will be confirmed in association with the contractor through the preparation of these more detailed design plans, which will reflect the mitigation measures proposed to minimize potential interactions between the Project and environment.

Volumes – Based on preliminary estimates, approximately 160,000 m³ of topsoil will be removed during stripping activities associated with construction of the pad/pad tracks, roadways and new tracks east of the existing mainline. The volume of topsoil required for the Project will be confirmed through detailed design. However, no imported topsoil will be required.

Development Plans and Design Criteria – Development plans proposed include those listed in Table 9.2 of EIS Section 9.8 (pages 343-344) and Appendix G. Further plans may also be refined to secure the necessary permits and approvals described in Table 1.1 of EIS Section 1.4.3 (pages 9-10). Design criteria for the Stormwater Management and Erosion and Sediment Control Plans are outlined in the Stormwater Management Strategy (Appendix B of the Surface Water TDR (Appendix E.15)), specifically Section 5.1 (page 7).

Gravel and Sand (Granular Material)

Location and Footprint – The location and footprint of granular material will occur within the PDA (EIS Section 3.4.1.1, page 54), with specific locations to be confirmed in association with the contractor through the preparation of more detailed design plans. There will be minimal stockpiles of granular material on-site in order to limit/avoid double handling of material.

Volumes – Granular material will be imported to the site in the following quantities (EIS Section 3.3.9, page 50):

- roadways (approximately 15,000 cubic metres (m³));
- pad including two yard tracks (approximately 330,000 m³);
- four yard tracks and the mainline realignment on the east side of the Terminal (approximately 30,000 m³); and,
- extension and additional track from Britannia Road to Derry Road (approximately 15,000 m³).

These volumes will be confirmed through detailed design.

Development Plans and Design Criteria – Development plans proposed include those listed in Table 9.2 of EIS Section 9.8 (pages 343-344) and Appendix G. Further plans may also be refined to secure the necessary permits and approvals described in Table 1.1 of EIS Section 1.4.3 (pages 9-10).

Construction Material Stockpiles

Location and Footprint – Two temporary construction laydown areas are identified within the PDA on EIS Figure 3 (Appendix B) and the use of these areas is described in EIS Section 3.3.9 (page 49). The footprint of construction material stockpiles will be confirmed in association with the contractor through the preparation of these more detailed design plans, which will reflect the mitigation measures proposed to minimize potential interactions between the Project and environment.

Volumes - The volume of construction material required for the Project will be confirmed through detailed design.

Development Plans and Design Criteria – Development plans proposed include those listed in Table 9.2 of EIS Section 9.8 (pages 343-344) and Appendix G. Further plans may also be refined to secure the necessary permits and approvals described in Table 1.1 of EIS Section 1.4.3 (pages 9-10).

IR5 – Project Schedule

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 3.2) require that the EIS include descriptions of the construction and operation phases of the Project. This includes a description of the activities that will be carried out during each phase; the location of each activity; expected outputs; an indication of the activity's magnitude and scale; and a schedule including time of year, frequency and duration for each activity.

Section 3.6 of the EIS does not provide details on the time of year, frequency or duration for all Project activities during the construction and operation phases. This information is required to assess the potential for environmental effects, including but not limited to effects on fish and fish habitat, species at risk and migratory birds.

Information Required: Provide a description and schedule of the Project construction and operation activities, including, at a minimum, the time of year, frequency and duration of the activities. Provide an assessment of any potential environmental effects related to Project timing.

CN Response:

A conceptual schedule used to complete the assessment of environmental effects, which reflects the proposed timing windows, is attached (see **Attachment IR5 – Conceptual Project Schedule**). These construction timing windows have been incorporated into the construction schedule to minimize and avoid potential environmental effects.

Description and Schedule – Construction

A description of the proposed construction activities is provided in EIS Section 3.4.1 (pages 53-60). The activities are proposed to start in 2017 extending over an 18 to 24 month period, with the operation of the Terminal to commence in 2019 (EIS Section 3.4.1, page 53). The Noise Assessment TDR (Appendix E.10) provides a further breakdown of construction activities during each phases of construction (TDR Section 4.3.2, Table 4.6 (pages 27 to 28) and TDR Appendix

D)). **Attachment IR5** provides the proposed time of year, frequency and duration of proposed construction activities.

Description of Schedule - Operation

A description of the proposed operational activities is provided in EIS Section 3.4.2 (pages 60 to 65). The Terminal is anticipated to be operational for 24 hours a day, seven days a week, in perpetuity (section 3.4.2, page 60).

Environmental Effects – Assessment and Project Timing

While the specific start date, timing and duration for individual construction activities is dependent on a regulatory review and approval, as well as the finalization of development plans, the assessment of potential effects on all VCs considered the timing, frequency and duration of proposed activities and potential interactions to identify the potential environmental effects and corresponding mitigation measures, which includes timing restrictions.

The assessment of environmental effects for the Project is provided in EIS Section 6.5 (pages 165 to 264), which includes discussion and results specific to each of the identified VCs. Specifically, considerations for the duration and frequency of proposed activities was considered in determining potential effects of the Project, proposed mitigation measures (i.e., timing windows) and characterization of residual environmental effects. **Attachment IR5** includes the timing windows during which specific project activities will be avoided or managed to minimize or avoid potential effects on VCs.

The following summary of potential environmental effects is provided specifically for each of the VCs in regards to timing, frequency and duration of effects:

Fish and Fish Habitat

Temporal boundaries are described in EIS Section 6.5.1.5 (page 170). The assessment of residual effects, including project pathways, mitigation measures and residual effects is provided in EIS Section 6.5.1.9 (pages 175 to 189). Specific reference to the duration and frequency of effects is also provided in Tables 6.14 to Table 6.17 (pages 180-187), and further summarized in Table 6.18 (page 188).

Migratory Birds

Temporal boundaries are described in EIS Section 6.5.2.5 (page 192). The assessment of residual effects, including project pathways, mitigation measures and residual effects is provided in EIS Section 6.5.2.9 (pages 196 to 205). Specific reference to the duration and frequency of effects is also provided in Table 6.22 (page 204).

Species at Risk

Temporal boundaries are described in EIS Section 6.5.3.5 (page 208). The assessment of residual effects, including project pathways, mitigation measures and residual effects is provided in EIS Section 6.5.3.9 (pages 212 to 219). Specific reference to the duration and frequency of effects is also provided in Table 6.24 (pages 208 to 209).

Human Health

Temporal boundaries are described in EIS Section 6.5.4.5 (page 221). The assessment of residual effects, including project pathways, mitigation measures and residual effects is provided in EIS Section 6.5.4.9 (pages 226 to 231). Specific reference to the duration and frequency of effects is also provided in Table 6.30 (page 231).

Socio-Economic Conditions

Temporal boundaries are described in EIS Section 6.5.5.5 (page 234). The assessment of residual effects, including project pathways, mitigation measures and residual effects is provided in EIS Section 6.5.5.9 (pages 240 to 245). Specific reference to the duration and frequency of effects is also provided in Table 6.36 (page 244).

Archaeological and Heritage Resources

Temporal boundaries are described in EIS Section 6.5.6.5 (page 250). The assessment of residual effects, including project pathways, mitigation measures and residual effects is provided in EIS Section 6.5.6.9 (pages 256 to 264). Specific reference to the duration and frequency of effects is also provided in Table 6.42 (page 263).

Any refinements made during the detailed designs and project schedule will be consistent with the mitigation measures identified in the EIS. These measures will be identified in the Environmental Protection Plan (EPP), as appropriate, and any refined information regarding the project schedule and design will be shared with CEAA as it becomes available.

ALTERNATIVE MEANS

IR6 – Alternative Means of Carrying out the Project

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 2.2) require that the EIS identify and consider the effects of alternative means of carrying out the Project that are technically and economically feasible. The Canadian Environmental Assessment Agency (CEA Agency)'s Operational Policy Statement Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012 should inform the preparation of the EIS for a designated Project. It should also be used in conjunction with other CEA Agency policy and guidance instruments. The Operational Policy Statement guides the proponent to identify the key valued components potentially affected by each alternative mean and to briefly examine the potential effects of those alternatives on each of the valued components.

Section 2.2 and Appendix F of the EIS describe the assessment of alternative means of carrying out the Project. Section 4.3.3 of Appendix F describes physical features (e.g., foreign crossings) and biophysical features (e.g., fish and fish habitat) identified as evaluation criteria in the assessment of four candidate sites for the Project. The candidate sites appear to be evaluated on the basis of the number of physical or biophysical features present on each site, rather than the potential environmental effects that the Project could have on those features or relevant valued components. For example, the number of wetlands or watercourse crossings does not necessarily describe the potential of a site to contain fish and fish habitat or migratory birds or the likelihood that the Project will affect those valued components.

In addition, it is not clear that mitigation measures were applied consistently when assessing the potential effects of the Project on the physical and biophysical features at each site. Only residual effects, that is, effects that remain after the application of technically and economically feasible mitigation measures, should be considered when assessing the potential effects of the Project at each candidate site.

Information Required: *Describe each of the candidate sites identified in Section 2.2 of the EIS according to the valued components listed in Section 6.3 of the EIS Guidelines. Describe the mitigation measures that were applied and the residual effects of the Project on valued components at each candidate site.*

Develop and describe criteria to compare the potential environmental effects of the Project on the valued components at each candidate site. Describe how each criterion was considered and the relative weight or importance given to each in determining the preferred site.

If factors other than the potential effects of the Project on the valued components were considered in determining the preferred site, describe those factors and the mitigation measures applied; how each factor was considered; and the relative weight given to each in determining the preferred site.

CN Response:

Section 2.2 of the EIS and Appendix F describe the assessment of alternative means of carrying out the Project. As indicated in the introduction to Section 2.2 of the EIS, CEAA's *Operational Policy Statement Addressing 'Purpose of' and 'Alternative Means' under CEAA 2012* was utilized as guidance. The four potential sites that were identified for further consideration – Halton Hills, Brampton North, North Milton and South Milton – are described in Section 2.2.1 and Appendix F, along with an explanation of the determination of South Milton as the preferred site.

In order to carry out a broader comparison, the four sites were not pre-screened for technical feasibility (as contemplated in the Operational Policy Statement) but instead subjected to the more extensive alternatives evaluation described in Appendix F. This approach was in part to address comments received from the municipalities and members of the public requesting rationale beyond property ownership for the location of the Terminal.

Given the broadly similar environmental features of each of the sites, one of the important components of the evaluation was the number of material physical features and biophysical features on each site that could potentially be environmentally affected by the Project. While each feature was of course not individually field-assessed, the size and nature of each feature was taken into account, along with the approximate extent to which it would be expected to play a material ecological or socio-economic role. Logically (particularly prior to the site-specific facility design that would follow selection of a preferred site) the more of these material features that are present on a site, the higher the likelihood the final site design will result in potential for adverse environmental effects and a corresponding need for measures beyond standard mitigation, potentially extending to tailored, more extensive mitigation to address that risk. Accordingly, a site with fewer of these potentially effected features is lower risk from an environmental perspective than a site with more of the features as potential interactions between the Project and these features are reduced.

Standard mitigation measures were considered in the evaluation for each site. In particular, it was assumed that each of the material features for each site would have the benefit of standard mitigation measures. It was also assumed there would be a risk for each of the sites that in some cases (after a full EIS) may require more tailored, extensive mitigation measures. The conservative (environmentally sensitive) assumption was made that eliminating residual effects may in some cases take more than standard mitigation measures, and so should be assumed to be present for all the features.

Attachment IR6 - Site Selection Alternatives Addendum provides the further explanation requested for the alternatives evaluation with reference to the VCs listed in EIS Section 6.3, potential environmental effects of the project on the VCs, and the development and application of the evaluation criteria. It also applies the technical feasibility pre-screening step of the Operational Policy Statement (CEAA, 2015).

With the exception of the technical feasibility of the alternative sites, the individual criterion were all given equal importance, rather than relegating some to a lesser status by assigning relative weighting. Sites considered unsuitable due to topography and grading of existing mainline, such that unacceptable rail grades (i.e., too steep) would result, were not considered suitable options for the intermodal facility (Appendix F, Section 4.1.1, pages 11 to 12). This consideration for the technical feasibility of alternative sites has been more explicitly incorporated into **Attachment IR6**.

Reference

Canadian Environmental Assessment Agency (CEAA). 2015. Operational Policy Statement: Addressing "Purpose of" and "Alternative Means" Under the Canadian Environmental Assessment Act, 2012. Aboriginal Interests.

IR7 – Selection of Valued Components

CEAA Comment:

Rationale: *The EIS Guidelines (Part 2, Section 5) require the proponent to document the valued components suggested by Aboriginal groups for inclusion in the EIS, whether they were included, and the rationale for any exclusions. Section 6.2.2 of the EIS states that the selection of valued components was carried out in consideration of issues raised by Aboriginal peoples including traditional knowledge obtained through consultation with Aboriginal communities; however it is not clear how Aboriginal input influenced valued component selection.*

Information Required: *Provide a description of the input from each Aboriginal group on the selection of valued components. Specify whether there were any valued components requested that the proponent did not include in the EIS and provide a rationale for their exclusion.*

CN Response:

The comments and views expressed by the various Aboriginal communities, which are summarized in EIS Section 5.6 (pages 101 to 104) were considered and informed the selection of

VCs. EIS Section 6.2.2 (pages 113 to 119) discusses the potential VCs considered in this EIS, as well as the rationale for their selection or exclusion (Table 6.1, pages 115 to 119).

During consultation for the Project, comments were received from the Six Nations of the Grand River (Six Nations), Mississaugas of the New Credit First Nation (MNCFN) and Nation Huron Wendat (Huron Wendat), as summarized in EIS Section 5.6.1 to 5.6.3 (pages 101 to 104). Despite efforts for consultation with the Métis Nation of Ontario (MNO), no comments were received from the MNO offices (EIS Section 5.6.4, page 104). Correspondence details are included in Appendix D8.7 – Aboriginal Community Documentation.

None of the Aboriginal communities identified or recommended specific VCs, nor commented on the list of VCs identified in the Draft EIS Guidelines. However, comments received from Aboriginal communities were reviewed and considered during the identification and selection of VCs, as follows:

Archaeological Resources

MNCFN, Six Nations and Huron Wendat expressed consideration for archaeological resources potentially affected by the Project, which supported the decision to include Archaeology and Heritage Resources as VCs in the EIS (Table 6.1, page 119 and EIS Section 6.5.6.3, page 247).

Fish and Fish Habitat

MNCFN expressed concerns for potential changes to fish species, fishing areas and fishing activities as a result of the Project (EIS Section 5.6.1, page 102), which reinforced the selection of the Fish and Fish Habitat VC.

Traditional Land and Resource Use (TLRU)

TLRU by Aboriginal peoples was considered as a potential VC, but was excluded from further assessment as described in EIS Section 6.2.2 (page 114), specifically Table 6.1 (page 117). Traditional land and resource uses (i.e., plant harvesting, ceremonies, spiritual practices) occur outside of the PDA and LAA and therefore will not be affected by Project-related activities (EIS Section 6.2.2, page 114). Other concerns expressed by Aboriginal communities, including fish and archaeological resources, are addressed under specific VCs and therefore TLRU was not carried forward as a specific VC (EIS Section 6.2.2, Table 6.1 page 117).

IR8 – Traditional Territories

CEAA Comment:

Rationale: *The EIS Guidelines (Part 2, Section 6.1.8) require the proponent to provide baseline information on Aboriginal groups, including the location of traditional territories with maps, where available.*

Information Required: *Provide maps and a description of the traditional territories of the Mississaugas of the New Credit First Nation, Six Nations of the Grand River, and the Nation Huron Wendat.*

CN Response:

CN invited Six Nations, MNCFN and Huron Wendat to provide maps and descriptions of their Traditional Territories to help inform the Project consultation process and the EIS. For correspondence details please see Appendix D8.7 – Aboriginal Community Documentation of the EIS.

An updated version of Figure 5 from Appendix B is provided showing the traditional territories of the MNCFN and Six Nations in relation to the existing reserve lands (see **Figure IR#8 in Attachment IR8 – Traditional Territories Supplemental Information**).

MNCFN provided a digital file defining their Traditional Territory on March 7, 2016, which is reflected on **Figure IR#8 (Attachment IR8)**. The MNCFN Traditional Territory extends from Lake Erie to Lake Ontario and inland west of London, north to Orangeville and east of Oshawa, and extends south along the Canada-United States border near Niagara Falls, Ontario.

Six Nations provided a letter to CEAA and CN on September 18, 2015, which referenced a document entitled "Land Rights – A Global Solution for the Six Nations of the Grand River". This document identifies multiple treaty areas that influence "Six Nations interpretation of their Traditional Territory in North America", including the 1784 Haldimand Treaty Area and the wider area specified by the 1701 Fort Albany Nanfan Treaty. Excerpts from this document (specifically pages 4 and 5) are included in **Attachment IR8**. An interpretation of the extent of the Six Nations Traditional Territory as taken from this document is included on **Figure IR#8 (Attachment IR8)**.

The 1784 Haldimand Treaty Area is 9.6 km wide and 299 km in length (3,592 km²). The 1784 Haldimand Treaty Area is near the shores of Lake Erie, by Dunnville, north through Brantford, Kitchener, along the west of Orangeville, and extends as far north as Durham, Ontario. According to the *Six Nations of the Grand River Consultation & Accommodation Policy* (September 24, 2013) referenced in the letter from Six Nations dated September 18, 2015, the "Nanfan Treaty of 1701 is the treaty lands within Southwestern Ontario and the United States that was the trade and economic base of Six Nations as well as (the) shared traditional hunting, gathering and fishing territories."

Huron Wendat have not provided a map or description of the Huron Wendat Traditional Territory. Consultation has occurred with Huron Wendat and to date no specific information pertaining to boundaries of their Traditional Territory has been provided.

CN will continue to engage with MNCFN, Six Nations, Huron Wendat and MNO for the duration of the Project. In the event that Six Nations or Huron Wendat provide additional Traditional Territory information during the EIS review period, such information will be provided to CEAA.

PHYSICAL AND CULTURAL HERITAGE

IR9 – Cultural Value

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Sections 6.3.4 and 6.3.5) require the environmental assessment to consider the effects to physical and cultural heritage, including changes to the cultural value or importance associated with physical and cultural heritage.

Section 6.5.6 of the EIS provides a physical and cultural heritage assessment, but does not describe the cultural value or importance of the 14 archaeological resources that were identified for further study.

Information Required: Provide a description or discussion of the cultural value or importance associated with the 14 archaeological resources that were identified in the cultural heritage assessment and archaeological study.

CN Response:

Of the 34 archaeological sites identified, 14 met MTCS criteria that indicate that these sites have cultural heritage value or interest (CHVI) and therefore recommendations were made that Stage 3 Archaeological Assessment (AA) occur at these 14 sites.

The cultural heritage value for the 14 archaeological resources is presented in more detail in Appendix E.14 (Stage 1-2 Archaeological Assessment). Specifically, a complete description of the artifacts found at each location is provided in Section 4 (Appendix E.14) and the corresponding cultural heritage value of the archaeological resources at each location is provided in Section 5 (Appendix E.14), as summarized in the following table:

Location #	Borden #	Artifact Description		Cultural Heritage Value	
		Section	Pages	Section	Pages
Location 2	AiGw-982	Section 4.4	45 to 53	Section 5.2	203 to 204
Location 3	AiGw-983	Section 4.5	53 to 61	Section 5.3	204
Location 4	AiGx-390	Section 4.6	61 to 64	Section 5.4	205
Location 7	AiGx-392	Section 4.9	66 to 67	Section 5.7	206
Location 12	AiGx-396	Section 4.14	79 to 106	Section 5.12	208
Location 13	AiGx-397	Section 4.15	106 to 119	Section 5.13	208 to 209
Location 18	AiGx-398	Section 4.20	123 to 129	Section 5.18	210 to 211
Location 28	AiGx-401	Section 4.29	142 to 148	Section 5.27	214 to 215
Location 29	AiGx-402	Section 4.30	148 to 150	Section 5.28	215
Location 38	AiGx-405	Section 4.39	160 to 163	Section 5.37	218 to 219
Location 45	AiGx-408	Section 4.43	167 to 175	Section 5.41	220
Location 51	AiGx-411	Section 4.49	186 to 187	Section 5.47	223
Location 57	AiGw-984	Section 4.55	193 to 197	Section 5.53	225
Location 58	AiGw-985	Section 4.56	198 to 199	Section 5.54	226

ATMOSPHERIC ENVIRONMENT

IR10 – Greenhouse Gases

CEAA Comment:

Rationale: The Minister of Environment and Climate Change and the Minister of Natural Resources recently announced principles to guide federal decision-making in relation to projects subject to federal environmental assessments.

In line with these principles, greenhouse gas emissions (including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃)) will be appropriately considered in ongoing environmental assessments under CEAA 2012. The Minister of Environment and Climate Change will take the predicted environmental effects of those emissions into account in making her environmental assessment decisions under CEAA 2012. Emissions analyses conducted through the environmental assessment process will contribute to the overall body of knowledge of sources of emissions in Canada. This in turn will inform ongoing efforts to address climate change in Canada.

For the purpose of an environmental assessment, direct emissions are defined as greenhouse gas emissions directly attributable to a project (for example, the burning of natural gas or diesel to generate power, methane released by soil and rock disturbance, et cetera).

Information Required: Provide an estimate of the direct greenhouse gas emissions associated with all phases of the Project, as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by individual pollutant and summarized in carbon dioxide equivalent units (CO₂ e) per year.

Provide an estimate of the Project's contribution to provincial and national greenhouse gas emissions.

An analysis of the predicted greenhouse gas emissions of the proposed Project in combination with other past, present and reasonably foreseeable projects should also be included in the cumulative effects assessment.

CN Response:

The EIS Guidelines issued to CN in July 2015 did not include a requirement for consideration of GHGs. CN nevertheless appreciates the importance of the issue and, in accordance with the Agency's request, is in the process of preparing a stand-alone GHG Report, which should be completed shortly.

IR11 – Baseline Air Quality

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 6.1.1) require the proponent to provide a description of ambient air quality and the results of a baseline survey of ambient air quality for the Project area.

Appendix E.1 of the EIS states that a baseline ambient monitoring program is currently being performed in the Local Assessment Area. A summary of the available monitoring data from this station has been provided (Appendix C5; Appendix E.1), however the air quality assessment does not include any of that data. The EIS states that data validation and subsequent incorporation of any revised modelling, if necessary, will be carried out in parallel to any review process, and an addendum will be issued in the future, as necessary.

Consequently this data has not yet been considered in the Human Health Risk Assessment.

Information Required: Provide a timeline for the collection of ambient air quality data, data validation, and subsequent incorporation of the data into any revised modelling.

Describe how and when the new data and modelling results will be applied to an updated Human Health Risk Assessment once the data analysis has been completed.

CN Response:

The EIS guidelines were addressed using published accepted ambient air quality data for the RAA of the proposed Project. Data sources were selected to be 'conservative' as is commonly and routinely conducted for EIS assessments. This existing data set, which includes a five-year regional meteorological dataset available from the MOECC for the Halton-Peel area, was used in the modelling assessment (Air Quality TDR, Appendix E.1, Section 7.1.1, page 63) and represents the baseline ambient air quality data appropriate for assessing the potential effects of the Project. The existing background data is sufficient to determine changes to the atmospheric environment resulting from the Project and the corresponding environmental effects, including potential effects on human health.

The supplemental collection of ambient air quality data described in EIS Section 9.4.1 (pages 333 to 334) is not part of the baseline data collection program in support of the EIS. This data collection program, which is currently underway, is part of the proposed follow-up monitoring program.

IR12 – Special Receptors

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Sections 6.2.1 and 6.3.5) require the proponent to consider potential effects to human health caused by changes to the atmospheric environment, including potential changes to air quality. Appendix E.1 of the EIS notes that residential dwellings on land owned by CN are considered participating receptors and were therefore not considered points of reception in the air quality assessment.

Appendix E.1 of the EIS also concludes that potential B[a]P emissions from the Project operations scenario are predicted to be above criteria in areas immediately surrounding the property, and are expected to be below criteria further than 900m from the Project Development Area. Although residential properties (farmhouses and residences) were identified as being present on CN-owned lands, information regarding these receptors, such as their respective distances from the Project Development Area, has not been provided.

Information Required: Provide an assessment of the effects of changes to air quality on human health for exposed individuals occupying the residential dwellings located on land owned by CN. The assessment is to consider the sensitivity of exposed individuals and a description of the location and distance of potential human receptors (permanent, seasonal or temporary) from the Project site.

Provide a rationale for the consideration of residences on CN-owned property as participating receptors rather than as points of reception.

CN Response:

Participating Receptors

"Participating Receptors" are receptors (existing dwellings) associated with the Project, located on land owned by CN that has not been considered as a Point of Reception (POR) in the effects assessment (as defined in Appendix E.1, page xi).

Supplemental Analysis

A supplemental analysis of the air quality effects on participating receptors has been completed (see **Attachment IR12 – Air Quality Analysis for Participating Receptors**), with the location and distance relative to the PDA for these receptors identified. Consistent with the Air Quality TDR (Appendix E.1) with respect to non-participating receptors, the only predicted exceedance is for B(a)P emissions.

Similarly, potential health risks are not expected from the inhalation of B(a)P emissions at these participating receptors. As considered in the HHRA (Appendix E.7, section 3.2, page 9), receptors of concern include people living in, working in or visiting the area that may be exposed to the COPCs while in the LAA. These residents and visitors include people of all ages, including people at sensitive life stages such as infants, children and the elderly. Further details are provided in **Attachment IR12**.

IR13 – Cumulative Effects

CEAA Comment:

Rationale: The CEA Agency's Operational Policy Statement Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012; the Technical Guidance for Assessing Cumulative Environmental Effects under CEAA 2012; and the EIS Guidelines (Part 2, Section 6.6.3) provide direction on the consideration of cumulative effects.

Section 6.4.1 of the EIS identifies predicted changes to the atmospheric environment as a result of the Project, including emissions from the operation of the Terminal along with background air quality conditions. Section 7.6 of Appendix E.1, Cumulative Effects Assessment, combines estimated background concentrations with maximum model-predicted values for the Project and compares these to applicable regulatory limits to assess potential changes in air quality in the local assessment area.

However, a discussion on how the Project contributes to or changes existing air quality conditions is representative of the effects of Project, rather than a cumulative effects

assessment, which must consider the changes to air quality as a result of the proposed Project in combination with past, present and reasonably foreseeable future projects and activities.

Information Required: Clarify whether the “cumulative” effects assessment presented in section 6.4.1 of the EIS and Section 7.6 of Appendix E.1 are meant to present the effects of the Project or a cumulative effects assessment which aligns with CEA Agency guidance.

If the assessment presented in section 6.1.4 of the EIS does not represent a cumulative effects assessment as described in CEA Agency guidance, provide an assessment of the cumulative air quality effects of the Project in combination with emissions from reasonably foreseeable future planned developments including any predicted increase in truck traffic associated with the Project and future residential developments.

CN Response:

For clarification, the assessment provided in EIS Section 6.4.1.1 (page 159 to 162) and Section 7.6 of the Air Quality TDR (Appendix E.1, pages 82 to 88) was intended to provide environmental effects assessment of the “combined” predicted values of the background air quality emissions and Project emissions (construction, operation) from the maximum concentrations of all COPCs at all special receptors. It does not include predicted emissions from other reasonably foreseeable future planned developments in the area.

The selection of Valued Components is described in Section 6.2.2 of the EIS, and is further supported by Section 5 of CEAA, 2012. Air quality was not selected as a VC for the Project, as the identified VCs in the EIS Guidelines (July 2015) as provided by CEAA did not identify air quality as such. Further to this, certain additional environmental effects must be considered under Section 5(2) of CEAA, 2012 where the carrying out of the physical activity, the designated project, or the project requires a federal authority to exercise power or perform a duty or function conferred on it under any Act of Parliament other than CEAA, 2012. Evaluated against these criteria, air quality did not warrant further evaluation as a VC, and was evaluated in the assessment as a potential environmental effect on a change in Human Health.

In accordance with CEAA guidelines, a cumulative effects assessment is completed on VCs for which residual environmental effects are predicted. The EIS Guidelines (July 2015) state that VCs that would not be affected by the project or would be affected positively by the project can, therefore, be omitted from the cumulative effects assessment (EIS Guidelines, page 30). Further, in accordance with the Operational Policy Statement: Assessing Cumulative Environmental Effects under CEAA, 2012, the cumulative environmental effects assessment should consider those VCs for which residual environmental effects are predicted after consideration of mitigation measures, regardless of whether those residual environmental effects are predicted to be significant (CEAA, 2015, page 3).

The environmental effects assessment for human health is found in Section 6.5.4.9 of the EIS (pages 226 to 231). In this section, predicted changes in air emissions based on the Project (as discussed in Section 6.4.1.1 of the EIS, page 159 to 162) were evaluated on the human health criteria and were determined to be negligible (EIS Section 6.5.4.9.3, page 230). As such, a cumulative effects assessment was determined not necessary for human health.

IR14 – Baseline Ambient Noise Levels

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 6.1.1) require a description of current ambient noise levels at key receptor points, including the results of a baseline ambient noise survey containing information on typical sound sources, geographic extent and temporal variations. Appendix E.9 of the EIS contains the results of a baseline ambient noise study, with data collected in July 2014 and June 2015. However, there is no explanation as to how this baseline data is considered representative of the typical conditions at the various receptors, including temporal variations.

Further, the ambient noise study in the EIS does not provide the meteorological data relevant to the ambient noise measurements.

Information Required: Provide additional ambient noise level baseline information to include typical sound sources, geographic extent and temporal variations (including seasonal). Where necessary, update the effects assessment in relation to noise and human health to incorporate this additional information.

Provide meteorological data relevant to the ambient noise measurements, including but not limited to precipitation, humidity level, and temperature.

CN Response:

Ambient Baseline Information

The Noise Baseline TDR (Appendix E.9) considered the temporal variations and spatial characteristics of the existing acoustical environment in the vicinity of the Project. The major contributors to the baseline acoustical environment are anthropogenic sounds, including sources such as existing mainline railway traffic, urban hum associated with development located north of the proposed Project area, and roadway traffic (Appendix E.9, Section 6.0, page 15).

The background noise levels measured in the baseline study are considered typical for this area, and are comparable to a suburban / urban residential area (Appendix E.9, Section 5.0, page 13). While noise levels will vary during the day due to road traffic and urban hum (i.e., day vs. night), seasonal fluctuations are not anticipated. Typical sound sources for this community type are provided in Appendix E of the Noise TDR (Appendix E.9, Table E.1, page E.1) based on CTA 2011.

Meteorological Data

The Ambient Noise Study TDR (Appendix E.9) was conducted in accordance with the requirements outlined in Section 6.1.1 of the EIS Guidelines and ISO-1996-2" Acoustics – Description, Measurement and Assessment of Environmental Noise – Part 2: Determination of Environmental Noise Levels". This guideline has been designed to ensure that the data is representative of the typical conditions at the various receptors. In accordance with these guidelines, the measurement periods were selected such that precipitation, humidity and temperature will not affect the measurement system, or measured ambient noise levels.

Baseline atmospheric conditions, such as temperature, precipitation, humidity levels, and wind speed and direction were confirmed appropriate for outdoor measurements during the monitoring program. As discussed in Appendix E.9, the measurement program was conducted July 16, 2014 to July 22, 2014 and June 3, 2015 to June 8, 2015, which represents a period of positive temperature, moderate humidity, less precipitation and moderate wind conditions (i.e., conditions conducive to obtaining accurate baseline measurements). Among the weather parameters, wind has the potential for high variability and has the ability to affect the measurement due to wind induced noise. Therefore, wind speeds during the ambient measurement program are presented in Appendix C of the Noise TDR (Appendix E.9).

Meteorological data specific to the site is not available. Therefore, for reference purposes, data taken from Pearson Airport (a distance of approximately 30 km from the study site) is provided (see **Attachment IR14 – Meteorological Data at Pearson Airport**). There were no extreme weather events of concern limiting the performance of the measurement system or artificially elevating the ambient sound level during the measurement periods. Conditions during data collection were considered appropriate by acoustical experts in accordance with the guidelines noted above.

GROUNDWATER AND SURFACE WATER

IR15 – Groundwater Flow

CEAA Comment:

Rationale: *The EIS Guidelines (Part 2, Section 6.1.4) require that the proponent provide a characterization of the hydrogeology at the local and regional scale including temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels) and graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality.*

Appendix E.6 of the EIS states that further monitoring is being carried out for the purpose of capturing seasonal variations in the groundwater table throughout the project development area and indicates that monitoring will continue until June 2016.

Information Required: *Provide a characterization of the hydrogeology at the local and regional scale including temporal changes in groundwater flow (e.g., seasonal and long term changes in water levels) and graphs or tables indicating the seasonal variations in groundwater levels, flow regime, and quality using the data currently being collected throughout the project development area.*

CN Response:

The available data / information for the area indicates the PDA is situated upon geological deposits of low permeability silt, clay and sandy to silty clay till, where the shallow groundwater system has a limited hydraulic connection to local surface water features and flows in a south to southeast direction towards Lake Ontario. Onsite data collected from the groundwater monitoring network established across the PDA, as incorporated into the Hydrogeological TDR (Appendix E.6) and subsequently in **Attachment IR15 – Supplemental Hydrogeological Conditions**, confirms these regional trends to be accurate at the local scale.

Regional Setting

Sections 2.2 and 2.3 (pages 7 to 10) of the Hydrogeological TDR (Appendix E.6) provide a regional characterization of the physiographic and hydrogeological conditions of the area, including geology, hydrostratigraphy, groundwater flow, groundwater quality, water supply and source water protection.

Figures showing existing known physiography, topography, surficial geology, groundwater monitoring stations and source water protection areas in the context of the Project are provided in the Hydrogeology TDR (Appendix E.6, Appendix A - Figure 2 to 6).

Local Setting

A characterization of the hydrogeological conditions is provided in the Hydrogeology TDR (Appendix E.6, Sections 4.0, pages 17 to 21 and Section 6.1, pages 27 to 28). An interpretation of groundwater flow based on water levels measured in a network of monitoring wells and drive-point piezometers from July to September 2015 is discussed in Section 4.2 of the Hydrogeology TDR (Appendix E.6, pages 18 to 19).

Follow-up Monitoring Data

Given the extensive background information and characterization of existing groundwater regime within the area, the level of study was sufficient to confirm the limited connection between surface and groundwater for this area. However, **Attachment IR15** has been prepared to summarize the results for the follow-up monitoring program to date. Information pertaining to groundwater levels, groundwater flow and quality is presented.

IR16 – Quality of Discharged Water

CEAA Comment:

Rationale: *The EIS Guidelines (Part 2, Section 6.2.2) require the proponent to provide a description of any changes to water quality that are predicted to result from changes to site drainage and leaching associated with Project activities, spills, erosion, and use of chemically treated construction materials, including the predicted water quality being discharged from the stormwater management ponds and any direct water discharged to watercourses.*

Section 6.4.2.3 of the EIS states that that localized surface water and sediment quality within Tributary A and Indian Creek are expected to improve during operations but discharge volumes or predict discharge concentrations for contaminants of concern into the receiving environment are not provided.

Information Required: *Provide predicted discharge concentrations for all contaminants of concern that may be released into the receiving environment as a result of Project activities during the construction and operations phases.*

CN Response:

A memo has been prepared to clarify the anticipated concentrations of contaminants of concern in surface water anticipated during operation of the Project (see **Attachment IR16 –**

Surface Water Contaminants of Concern). Details regarding contaminants of concern during construction are addressed in the response to IR17.

IR17 – Water Quality During Construction

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 6.2.2) require the proponent to describe predicted changes to the environment surface water including changes to turbidity, oxygen levels, water temperature, and water quality including predictions regarding salinity or concentrations of other substances used for winter maintenance of the paved surfaces. The EIS Guidelines (Part 2, Section 6.2) also require that predicted changes to the environment be considered in relation to each phase of the Project, including construction and operation.

Appendix E.15 of the EIS provides a description of the predicted changes to surface water quality for the post-construction period only; there is no description for the construction phase. As such, section 6.5.1, 6.5.2, and 6.5.3 of the EIS provide no assessment of the potential environmental effects of changes in water quality during the construction period on fish and fish habitat, migratory birds, and species at risk, respectively.

Information Required: Provide a description of the predicted changes to surface water quality during the construction period as required by the EIS Guidelines.

Provide an assessment of the potential environmental effects of changes to surface water quality during the construction phase on fish and fish habitat, migratory birds, and species at risk.

CN Response:

A memo has been prepared to clarify the predicted changes to surface water quality during construction, with reference to where this information was incorporated into the EIS (see **Attachment IR17 – Surface Water Quality Effects During Construction**).

CHANGES TO THE TERRESTRIAL LANDSCAPE

IR18 – Changes to the Terrestrial Landscape

CEAA Comment:

Rationale: The EIS Guidelines (Part 1, Section 1) state that it is the responsibility of the proponent to provide sufficient data and analysis on potential changes to the environment to ensure a thorough evaluation of the environmental effects of the Project.

The EIS Guidelines (Part 2, Section 6.2) require that the predicted changes to the environment be considered in relation to each phase of the Project and be described in terms of the geographic extent of the changes, the duration and frequency of the changes and whether the environmental changes are reversible or irreversible. The EIS Guidelines (Part 2, Section 6.2.3) also require the EIS to describe the predicted changes related to the terrestrial landscape; including an overall description of changes related to landscape disturbance.

Section 6.4.3 of the EIS states that 177.5 hectares of land will be directly changed by construction of the Project. While EIS Sections 6.5.2 and 6.5.3 contain some description of the landscape that will be changed, it does not account for all the proposed changes to the terrestrial landscape.

Information Required: Provide a full description of the predicted changes to the terrestrial environment as required by Part 2, Section 6.2 of the EIS Guidelines.

CN Response:

Existing conditions within the PDA and LAA are provided in the Terrestrial TDR (Appendix E.16). Predicted changes to the terrestrial environment are summarized in EIS Section 6.4.3 (page 165), with further descriptions of proposed changes to the terrestrial landscape provided on a VC basis for both the migratory birds (Section 6.5.2, page 189) and species at risk (Section 6.5.3, page 205). In particular, the species at risk section included consideration for vegetation as well as a variety of wildlife habitat, including amphibian, reptiles, birds and bats. Mitigation in these sections covers each area of wildlife habitat in the PDA and LAA.

Provided below is a discussion of predicted changes to the terrestrial landscape that are more general than the species specific discussion in the species at risk section.

The terrestrial landscape in the area is comprised of agricultural fields with isolated woodlands and wetlands as well as sparse hedgerows (Terrestrial TDR, Appendix E.16, Figure 4). The PDA consists of 177.5 ha, the majority of which consists of active agriculture in annual row crops (i.e., soya, corn, wheat). A portion of this area consists of perennial hay fields or fallow fields, including thickets, while wetlands comprise a relatively small portion of the PDA.

Site clearing and grading activities are anticipated to result in the largest change in the terrestrial landscape. These site preparation activities, as described in EIS Section 3.4.1.1 (page 53 to 54), will result in the loss or alteration of 177.5 ha of the terrestrial landscape, including 50.9 ha of grassland, thicket or fallow areas and 3.7 ha of wetland (EIS Section 6.4.3, page 165). The remainder of the area to be affected is comprised of agricultural landscape.

Vegetation removal during site clearing activities will result in the removal of existing vegetated areas. However, no rare vegetation communities or rare vascular plants have been identified within the PDA (Section 5.2, Appendix E.16). Therefore, no loss to rare vegetation will occur.

Habitat for provincially common amphibian species occurs within the PDA, specifically along Indian Creek, Tributary A, and Tributary C (EIS Section 5.3, Appendix E.16). Amphibian habitat within the PDA will be retained through the proposed wetland enhancement measures, as identified on the Indian Creek and Tributary A Design Drawings (Appendix E of the Channel Realignment TDR (Appendix E.2)).

The PDA provides habitat for snake species that occur in agricultural landscapes (Section 5.7, Appendix E.16), which will be removed by site preparation. However, the habitat assessment did not find any specialized habitats (i.e., hibernacula or nesting sites) that will be directly impacted by site preparation.

The PDA also provides habitat for mammalian species of agricultural landscapes (Appendix C of Appendix E.16), which will be lost or altered during site preparation. However, no specialized habitats for mammals, such as denning sites, were found within the PDA.

Parcels of natural habitat (i.e., woodlands or wetlands) retained within the LAA will be kept in full and not split by Project components. These areas are located outside of the PDA and therefore construction of the Project will not fragment these natural areas.

Noise associated with the construction of Project site buildings, associated infrastructure and facilities, as well as construction equipment may cause a temporary disturbance or change in wildlife use of habitat within the LAA. However, this change is anticipated to be minor and reversible (temporary during construction), and is further discussed in the response to IR19.

Changes in breeding bird habitat are discussed in the migratory birds section of the EIS (section 6.5.2, page 189). Changes of habitats for turtles and bats are discussed in the species at risk section of the EIS (section 6.5.3, page 205).

Overall, based on the above discussion, the change in terrestrial landscape during construction is considered to be adverse, low in magnitude, restricted to the geographic extent of the LAA, short-term in frequency, permanent in duration and irreversible.

During operation of the Project, there is no anticipated Project related encroachment into terrestrial habitat, such as woodlands, wetlands or grassland. As such, no direct impacts to terrestrial habitat within the LAA are anticipated. Potential indirect impacts during construction include changes in wildlife use of habitats in the LAA due to acoustic emissions from truck movement, train and lift operations and equipment maintenance as well as the presence of workers. Indirect impacts during operation to migratory birds are discussed in Section 6.5.2.9.3 (page 202 to 203) of the EIS. This discussion is applicable to most other wildlife in the LAA, which would experience similar levels of disturbance. Barber et. al. (2010) suggest that physiological responses to noise exposure in animals may begin to appear at exposure levels of 55- 60 dB(A). Baseline acoustic monitoring found the background noise in the range of 68 to 74 dB in the grassland and woodland habitats in the LAA. As such, wildlife currently inhabiting the LAA are accustomed to noise exposure (see response to IR19). Furthermore, there is an existing presence of humans due to the existing agricultural practices; labour requirements within the facility are not anticipated to increase the level of disturbance to terrestrial habitats in the LAA. Overall,, most wildlife present are anticipated to habituate to the slight changes in noise and human presence.

The change in terrestrial landscape from operation is considered to be adverse, low in magnitude, restricted to the geographic extent of the LAA, continuous in frequency, permanent in duration and reversible.

SPECIES AT RISK AND MIGRATORY BIRDS AND THEIR HABITAT

IR19 – Noise

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 3.3.3) require that potential environmental effects of the Project be assessed for all Project phases, including construction and operation. The EIS Guidelines (Part 1, Section 4.2) also require that all conclusions be substantiated.

In section 6.5.2.9.2 and 6.5.2.9.3, the EIS describes theoretical environmental effects of noise that could result from construction activities. However, the potential environmental effects of noise during the construction phase of the Project on migratory birds and species at risk have not been assessed. No data (existing baseline or anticipated changes as a result of the Project) are provided.

Additionally, Section 6.5.2.9.2 of the EIS does not provide an assessment of potential effects of noise during the operation phase on migratory birds. Instead, the EIS states that baseline noise levels were found to already be high in the Local Assessment Area and therefore the habitats were already affected by high noise levels, without discussing the anticipated degree of change that may occur as a result of the Project or how those changes would or would not have an effect on migratory birds.

Information Required: Provide an assessment of the potential environmental effects of noise during the construction and operation phases of the Project on migratory birds and species at risk. Provide data and analysis to substantiate the conclusions of this assessment.

CN Response:

Construction

The Noise Effects Assessment (Appendix E.10 of the EIS) found that during construction, noise levels are expected to increase between 0 to 6 dB at the various receptors. While construction will result in slightly larger changes in noise level than operation, these changes will be temporary in nature. Noise levels during construction will be similar to baseline conditions; above the minimum threshold for physiological response in wildlife, but within levels wildlife can become habituated. As such, species habituated to baseline noise levels are not anticipated to experience displacement from construction or operation. Disturbance during construction may cause temporary displacement of a small number of locally occurring birds to adjacent areas where there are fewer disturbances.

Operations

To assess the potential environmental effects of noise on migratory birds and SAR habitats during operation, noise modelling was completed at four reference wildlife habitat locations within the PDA and LAA to compare baseline and operational conditions. These points of reception are identified on **Figure IR#19** (see **Attachment IR19 – Wildlife Noise Assessment Locations**).

A baseline for ambient noise data was determined using sound levels measured at representative locations adjacent to these habitats located outside of the PDA. Operational sound levels were determined in consideration of full development conditions, including facility, noise mitigation measures and future development in the LAA.

The ranges of noise levels during baseline (68 to 74 dBA) and operational (69 to 76 dBA) conditions were identified in EIS Section 6.5.2.9.2 (pages 201 and 202). The following table has been prepared to identify the specific changes to noise expected at each of the locations:

Wildlife Habitat	Noise Level (dB)	
	Baseline	Operation
1 - Woodland at south end of LAA	68	73
2 - Grassland (hay) in LAA south of Lower Base Line	74	76
3 - Grassland (hay) in LAA west of Tremaine Road	72	71
4 - Grassland (hay) in LAA north of Britannia Road.	71	69

Note: Location of these habitats is identified on **Figure IR#19**.

Based on the literature review in EIS Section 6.5.2.9.2 (pages 200 to 201), physiological responses to noise exposure in birds may begin to appear at exposure levels of 55 to 60 dB (Barber et al., 2010). The noise modeling indicates habitats within the LAA are already experiencing noise levels in excess of the minimum thresholds, and as such, these habitats are anticipated to already be affected by high noise levels from existing roads and development. Anticipated noise levels during operation are not anticipated to increase substantially beyond the existing baseline conditions.

While increased noise effects are anticipated, the increases are slight and within levels that allow wildlife to habituate. The noise modelling shows minimal change in noise in wildlife habitats between baseline and operating conditions. At some grassland habitats within the LAA, noise levels are predicted to be reduced from baseline conditions due to implementation of mitigation measures, such as berms. Overall, species living/utilizing the LAA currently are habituated to the baseline noise levels and are not anticipated to experience any additional disturbance from noise levels during operation.

Further, existing research in the US indicates that existing rail lines do not impede breeding or migratory uses of adjacent habitats (Whelan, et al., 2014).

References

Barber J.R., Crooks C., and Fristrup K. 2010. The costs of chronic noise exposure for terrestrial organisms. *Trends in Ecology and Evolution*. 25:180–189.

Whelan, et al. (2014). Composition and Reproductive Ecology of Breeding Bird Assemblages at Selected Natural Areas Along the EJ&E Rail Corridor, 2009–2013. In *Impacts of the Elgin, Joliet, and Eastern Railway Line on Natural Areas in the Western Chicago Metropolitan Area*. Heske, E. J., and D. M. Ruffatto, eds. 2014.

MIGRATORY BIRDS AND THEIR HABITAT

IR20 – Baseline Information

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 6.1.6) require the proponent to describe year-round migratory bird use of the area (e.g., winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources, or surveys to provide current field data.

Appendix E.16 of the EIS provides a description of the breeding bird community in all habitat types within the Local Assessment Area and Project Development Area. However, habitat use by migratory birds outside their breeding season (i.e., during winter, spring migration, fall migration), which may represent a different species assemblage, is not provided.

Information Required: Provide a description of habitat use outside the breeding season, including additional information from existing or field collected data in order to fully establish year-round (e.g., winter, spring migration, breeding season, fall migration) migratory bird use of the Local Assessment Area and Project Development Area.

CN Response:

Concentrations of migratory birds within the PDA and LAA are not expected outside of the breeding season. There are no habitats or features likely to attract a concentration of migrating or staging birds and no known occurrences of high migratory bird activity / concentration within the PDA or LAA for the Project (EIS Section 6.5.2.9.1, page 199).

The ground surface throughout the project site is composed largely of farm fields, the majority of which are row crops (i.e., soybeans, corn, wheat, etc.). Recognized natural features (i.e., wetland complexes which could support migratory birds in concentration) were identified during the background review and any notable features likely to support concentrations of migratory or staging birds are located outside of the PDA (Appendix E.16, Section 5.1.1, page 17).

The results of the background review process, as described in the Appendix E.16 (Section 4.1, page 9), did not identify the site as supporting habitat for migratory or staging birds, which was confirmed through the vegetation community classification surveys. Though small parcels of wetland habitat occurred, the wetlands are not anticipated to be of important value to migrating or stopover waterfowl, given their small size and composition. There are no habitat types or natural heritage features within the RAA that are likely to attract a concentration of migrating or staging birds (EIS Section 6.5.2.9.1, page 199). The Project site does not contain the features or characteristics that are typically associated with concentrations of migrating landbirds in stopover or staging areas (e.g., woodland areas and peninsulas located along shorelines), therefore no surveys for birds were required outside the breeding season.

Although the background review and an analysis of the habitat types available at the Project site did not indicate these sites are likely to support concentrations of migratory or staging birds, consideration of the effects to these groups was included in the EIS (Section 6.5.2.4, page 190). Given that the Project is sited primarily in agricultural lands (i.e., lands not extensively used by

migratory birds outside of the breeding season), potential effects of habitat loss on migrating and staging birds is anticipated to be minimal, regardless of the season. However, mitigation measures related to other potential impacts (i.e., mortality) were included to minimize potential effects to migratory birds that may use the site at various times of the year (EIS Section 6.5.2.9.1, page 199, and Appendix G, page 4). Further, CN will implement the creation of offsite grassland habitat to offset the loss of migratory bird grassland habitat resulting from the construction of the Terminal (EIS Section 6.5.2.9, pages 201 and 205, and Appendix G, page 4).

SPECIES AT RISK

IR21 – CC Values

CEAA Comment:

Rationale: The EIS Guidelines (Part 1, Section 4.2) require that all conclusions be substantiated and predictions be based on clearly stated assumptions.

Section 6.3.7 of the EIS states that “[n]one of the species observed had a conservatism value of 9 or 10.” The EIS does not explain the meaning of those values, nor does it provide a context for their use. Section 4.3.1 of Appendix E.16 explains that identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, which ranges from zero (low) to ten (high), and is based on a species’ tolerance of disturbance and fidelity to a specific natural habitat.

In addition, Appendix B of Appendix E.16 provides a CC value for many of the plants in its botanical list without explaining what those values mean or how they were derived, and provides no explanation for how these terms are relevant or related to the environmental assessment.

The EIS does not provide an indication of how CC values were developed or provide a context for their use.

Information Required: Discuss how the CC values were determined, what the CC values were used for and how they are relevant to the findings of the baseline study and effects assessment for the Project.

CN Response:

Coefficient of Conservatism (CC) values are commonly used in Ontario and are indicative of the tolerance of vascular plants to changes in habitat. The CC value for each plant species ranges from 0 to 10; 0 being the most tolerant and 10 being the least tolerant to change. The CC values are an appropriate mechanism to describe whether individual plants or their habitats are sensitive to change resulting from adjacent project activities.

CC values are assigned for any given geographical area by qualified individuals with a comprehensive knowledge of the ecology of local vegetation. In Ontario, CC values have been assigned by botanists at the Ontario Natural Heritage Information Centre and published in the Floristic Quality Assessment for southern Ontario (Oldham et. al., 1995). For each of the plant

species identified within the LAA, the CC values from Oldham et. al. (1995) are provided in Appendix B of the Terrestrial TDR (Appendix E.16).

Reference

Oldham, M. J., W. D. Bakowsky, and D. A. Sutherland. 1995. Floristic quality assessment system for southern Ontario. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario. 23 pages + checklist for southern Ontario.

FISH AND FISH HABITAT

IR22 – Environmental Effects Assessment

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 6.3.1) require that environmental effects of changes to the aquatic environment on fish and their habitat be assessed in the EIS. Section 6.5.1 of the EIS includes identification of theoretical potential environmental effects, effect pathways and measurable parameters (Table 6-9), and potential Project-environment interactions (Table 6-11). These effects are further discussed in Section 6.5.1.9.

However, not all of the effect pathways (changes to the environment) and specific measurable parameters identified in the EIS (Table 6-9) or potential Project-environment interactions identified in Table 6.11 are described in the assessment. Additionally, in some cases, baseline information for the measurable parameters and sufficient descriptions of the expected measurable change that the Project would cause to the environment have not been provided.

For example, change in fish movement, migration and fish passage is identified in Table 6.9 as a potential environmental effect of the Project which could be measured by minimum and maximum seasonal flows (m³/s) and the creation of in-water flow or passage obstructions. Table 6.11 indicates that potential Project-environment interactions for this valued component would result from construction-phase activities such as terminal infrastructure, watercourse realignments, restoration and naturalization and acoustic emissions.

Section 6.5.1.9.3 of the EIS indicates that construction activities might result in a temporary blockage or diversion of flow resulting in the blockage of fish passage for a short duration. Although the EIS states that the degree of alteration or restriction will depend on the timing of construction and the mitigation measures applied, no specific details of the change to the environment that would alter fish movement, migration or passage is provided with respect to these temporary blockages. Additionally, no information is provided on existing minimum and maximum seasonal flows, how those flows are expected to change as a result of the Project, the timing of those changes, and how those changes would in turn affect fish and fish habitat.

Information Required: Describe the environmental effects of the Project on fish and fish habitat based on the predicted changes that the Project may cause to the environment. Describe the timing, duration and magnitude of these changes in measurable terms to allow the effects of the Project to be compared with existing environmental conditions.

For each measurable parameter identified for the potential environmental effects in Table 6.9 provide a quantitative description of the existing environmental conditions, a description of how

the Project is expected to result in a change to the measurable parameter, and a discussion of the implications of that change to fish and fish habitat that are likely to be affected by the Project.

CN Response:

A quantitative description of the potential environmental effects to fish and fish habitat for each measurable parameter identified in Table 6.9 (page 169) is provided in the following sections of the EIS and associated TDRs:

- EIS: Sections 6.5.1.9.2 (pages 175 to 180);
- Fish and Fish Habitat TDR (Appendix E.4): Sections 5.1.1 (page 18) and 5.1.2 (page 20);
- Channel Realignment TDR (Appendix E.2): Sections 6.1.1.5 (page 17), 6.1.3.11 (page 26), 6.2.1.5 (page 38) and 6.2.3.11 (page 47); and
- Surface Water TDR (Appendix E.15): Sections 5.4 (page 40), 5.5 (page 43) and 5.6 (page 54).

However, to assist, a summary of the assessment of potential effects on fish and fish habitat based on the measurable parameters identified in EIS Table 6.9 has been prepared and is provided in **Attachment IR22 - Summary of Assessment of Potential Effects on Fish and Fish Habitat**. This table identifies the effect pathway, measurable parameters and units of measurement as identified in EIS Table 6.9, as well as a quantitative description of the existing environmental conditions, a description of how the Project will result in changes to existing conditions, and discusses the implication of such changes on fish and fish habitat.

Proposed mitigation measures are intended to minimize the potential risk to fish and fish habitat and include commonly accepted construction techniques and mitigation measures typically approved by agencies. These measures are identified throughout EIS Section 6.5.1.9 (pages 176, 177, and 182 to 186). Final details regarding channel relocation, habitat enhancements, design of isolation measures, and timing, duration and magnitude of flow / passage disruptions will be refined in consultation with DFO during the *Fisheries Act* approval process (EIS Section 6.5.1.9.7, page 188).

MITIGATION MEASURES, MONITORING AND FOLLOW-UP PROGRAMS

IR23 – Mitigation Measures

CEAA Comment:

Rationale: *The EIS Guidelines (Part 2, Section 6.4) require the assessment to consider measures that are technically and economically feasible and that would mitigate any adverse environmental effects of the Project. Each measure is to be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation. Further, the EIS is to specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the Project's various phases to eliminate or reduce the significance of adverse effects. The EIS is also*

to present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures.

The EIS and its appendices outline recommended mitigation measures for specific valued components. While some of the commitments, summarized in Appendix G, are written as specific commitments, many others do not provide certainty as to how they will be implemented or are written as conditional statements (i.e., "should", "whenever possible", "as needed" or "where necessary") without specification as to what conditions must be met for the mitigation measure to be implemented.

Where best management practices are put forward as mitigation measures, there are no specific description of what actions, works or minimal disturbance footprint techniques, technologies or corrective measures CN proposes to use.

The EIS does not contain a discussion regarding the level of confidence in the effectiveness of the proposed mitigation measures.

Additionally, there are mitigation measures identified in the technical reports in Appendix E that are not mentioned within the main EIS. Many of these measures are written as recommendations but there is no apparent commitment to implement these measures.

Information Required: *Review all mitigation measures identified in the EIS and apply the requirements of the EIS Guidelines. Ensure measures are written as specific commitments that clearly describe how they will be implemented. Best Management Practices should be described and commitments should be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity.*

Additionally, discuss the level of confidence that the proposed mitigation measures will be effective. Clarify whether mitigation measures identified throughout Appendix E will be adopted.

CN Response:

As requested, we have reviewed all mitigation measures in the EIS and are confident in their ability to be effective. As outlined in the cover letter submitted to CEAA in conjunction with the EIS (December 7, 2015), CN is committed to implementing the mitigation measures stated in the EIS, including those identified in EIS Section 6.5, page 165 to 264 (as listed in each specific VC), Table 7.1 (page 311 to 320), EIS Section 10.2 (page 354 to 355), Appendix G and the supporting TDRs (Appendix E), as applicable. These measures will be employed throughout the construction or operation of the Project and will be confirmed or refined based on detailed design and construction plans.

Proposed mitigation measures are based on standard practices that, where successfully implemented during construction and/or operation, are expected to address the relevant potential effects. These measures are specific to manage potential changes to the environment, are achievable and will be measured and verified through the Environmental Protection Plan (EPP) and follow-up monitoring programs to confirm effectiveness.

Some mitigation measures or commitments are intentionally flexible in their description (e.g., vegetation and soils, wildlife and wildlife habitat) in part based on the uncertainty of the dates

these activities will be completed and may need to be modified to fit the construction windows. For example, CN is committed to avoid tree removal / clearing during the breeding bird season. However, where there may be instances where trees need to be removed during this time period, the secondary mitigation measure of using biologists to sweep the specific trees for breeding bird use would then be implemented (EIS Section 6.5.2.9.1, page 199 to 200, and Appendix G, page 4). The specific mitigation to be followed will be based on construction timing and detailed design, however either mitigation approach is appropriate as it will avoid effects on migratory birds during the breeding bird season.

Specific mitigation measures that are required to minimize or reduce environmental effects are listed in each VC discussion within EIS Section 6.5. These measures are summarized in EIS Table 7.1 and Appendix G, which contains the complete list of technically and economically feasible mitigation measures proposed to address potential environmental effects on VCs.

Additional mitigation measures identified in the various TDRs (Appendix E) and Table 7.1 of the EIS, as summarized in **Attachment IR23 - Supplemental Mitigation Measures**, were not included in Appendix G but will be implemented, as applicable. These measures, along with other recommendations provided during the EA process, will be reviewed and considered in conjunction with the contractor and refined as part of the preparation of the various plans outlined in the EIS prior to construction. Some measures will require adjustment based on detailed design of the Terminal and finalization of the construction schedule. Appropriate BMPs and generalized commitments already listed or that may be added based on design or through ongoing discussion with stakeholders will be listed as part of the EPP for implementation during construction and operation of the Project.

IR24 – No Question Provided

No IR24 provided by CEAA. This section included for completeness.

CUMULATIVE EFFECTS ASSESSMENT

IR25 – Methodology

CEAA Comment:

Rationale: The EIS Guidelines (Part 2, Section 6.6.3) require that the proponent assess the cumulative effects of the Project in combination with the effects of other past, present and reasonably foreseeable physical activities. The approach should follow the CEA Agency's Operational Policy Statement on Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 as well as other CEA Agency guidance materials.

Section 6.2.10 of the EIS states that Table 6.2 identifies the list of specific past, present and future projects and activities that have been considered in the environmental assessment for the purpose of evaluating cumulative environmental effects. The EIS also states that Tables 6.43, 6.45, 6.47, and 6.49 list all the past and present physical activities and resource uses that have contributed to a change in fish and fish habitat, migratory birds, species at risk and socio-economic conditions, respectively, in the regional assessment area. However, it appears that

the tables do not include the same projects and activities. For example, Table 6.2 does not mention or describe "Agricultural Conversion" even though it is included in the other tables and not all the projects and activities listed in Table 6.2 are listed in Tables 6.43, 6.45, 6.47, and 6.49.

Additionally, while Table 6.2 provides a general description of the projects and activities included in the cumulative effects assessment, the EIS provides no description of how the past projects and activities have already impacted the valued components. For example, the Section 6.6.1.2.1 of the EIS states that "[a]ll past and present physical activities and resource use listed in Table 6.45 have contributed to a Change in Migratory Bird mortality..." but only discusses theoretical environmental effects that could

have an effect on migratory birds. There is no discussion of how valued components have changed over time or specific environmental effects of those projects and activities.

Also, the EIS does not provide a rationale for why certain phases of a project or activity were not considered in the cumulative effects assessment. For example, Section 6.6.1.2.2 of the EIS states that residual effects from the Project on migratory bird mortality could interact with both construction and operation phases of some projects, whereas for other projects the consideration was limited to the construction phase without a rationale for why the operations phase was not considered.

Finally, the EIS does not provide the temporal boundaries of the cumulative effects assessments.

Information Required: Identify the temporal boundaries used in the cumulative effects assessments and provide a rationale for their selection.

Provide a comprehensive list of all the projects and activities – past, present and reasonably foreseeable – considered in the cumulative effects assessment. Describe each project and activity including a description of the associated environmental effects that are likely to interact with the residual effects of the Project.

For each valued component, provide a rationale for why each identified project or activity is considered or excluded from the cumulative effects assessments. Where applicable, provide a rationale for considering only certain phases of a project or activity (e.g., construction but not operation).

CN Response:

Temporal Boundaries

The temporal boundaries used for the cumulative effects assessment are the same boundaries that were used in assessing the residual environmental effects on each VC. Each temporal boundary for the various VCs has been identified in EIS Section 6.5 (pages 165 to 264).

Comprehensive List of Projects

A comprehensive list of all the projects and activities – past, present and reasonably foreseeable – that was considered in the cumulative effects assessment is provided in Table 6.2 of the EIS (Section 6.2.10, pages 125 to 128). An assessment of cumulative effects on each VC is provided in Section 6.6.1 (page 264 to 289), with specific projects considered to cumulatively affect each VC identified in Table 6.43 (page 265), Table 6.45 (page 271), Table 6.47 (page 278) and Table 6.49 (page 286).

In response to this IR, a revised version of Table 6.2 has been prepared to identify the environmental effects of past, present and reasonably foreseeable future projects likely to interact with Project residual effects, as well as the rationale for inclusion and exclusion of each project (and each corresponding project phase) in the cumulative effects assessment (see **Attachment IR25 – Supplemental Project Information for Cumulative Environmental Effects**).

This information is provided specific to each of the identified VCs and identifies how specific projects were grouped together (i.e., multiple residential developments) in the cumulative effects assessment (EIS Section 6.6.1) based on similar activities and potential effects. All projects in Table 6.2 of the EIS were considered in the cumulative effects assessment for each VC. For past and present projects (noted with a status of operational or under construction in the Table 6.2), the projects were grouped in Tables 6.43, 6.45, 6.47 and 6.49 as follows:

- Residential and Infrastructure Development included Bristol Planning District, Sherwood Planning District, and Halton Region Waste Management Site, which are all operational (past projects) in the assessment.
- Linear Infrastructure (Utilities, roadways, transmission lines) included Louis St. Laurent Avenue (Tremaine Road to Yates Boulevard); Main Street Grade Separation; Main Street West (Tremaine Road to Bronte Street); Tremaine Road (Derry Road to Britannia Road); Hydro One Bruce to Milton Transmission Reinforcement Project; and Union Gas Parkway West Project. These are all projects that are operational (past projects) or under construction (present projects) in the assessment.

Foreseeable future projects remained as individual projects in these EIS tables, and effects of these future activities considered during the cumulative effects assessment.

The revised Table 6.2 (**Attachment IR25**) incorporates agricultural conversion as having a potential to interact cumulatively with the Project, which was considered in the cumulative effects assessment in EIS Section 6.6.1 but omitted in error from the original Table 6.2 of the EIS.

Rationale for Inclusion / Exclusion

In accordance with CEAA guidance, as noted in the response to IR13, the cumulative environmental effects assessment should consider those VCs for which residual environmental effects are predicted after consideration of mitigation measures, regardless of whether those residual environmental effects are predicted to be significant (CEAA OPS, 2015, page 3).

Where past and present projects (as listed in the revised Table 6.2) were considered and not anticipated to act cumulatively with the effects of the Project (either temporally or spatially) for individual VCs, these projects or project phases were discussed in Section 6.6.1 of the EIS. This information has been included in **Attachment IR25** for each project, project phase and VC.

ATTACHMENT IR1 – AMENDED CONCORDANCE TABLE 1.2

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
Part 1 - Background	
1. Introduction	
2. Guiding Principles	
2.1 Environmental assessment as a planning tool	EIS Submission
2.2 Public Participation	Chapter 4 Community and Stakeholder Consultation Appendix D Record of Consultation
2.3 Aboriginal Engagement	Chapter 5 Aboriginal Engagement and Concerns Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Section 9.4.8 Aboriginal Peoples Section 10.4 Summary of Aboriginal Engagement Appendix B Figures, specifically Figure 5 Aboriginal Reserves Appendix D Record of Consultation, specifically Appendix D1.3, D7 and D8
2.4 Application of the precautionary approach	EIS Submission, particularly: Chapter 6 Effects Assessment Chapter 9 Follow-up and Monitoring Program Appendix E Technical Data Reports Appendix G Mitigation Measures and Commitments
3. Scope of the Environmental Assessment	
3.1 Designated Project	Section 1.2 Project Overview Section 3.3 Project Components Section 3.4 Project Activities
3.2 Factors to be considered	EIS Submission (further details provided in Part 2 of this Table)
3.3 Scope of Factors	
3.3.1 Changes to the Environment	Section 6.4 Predicted Changes to the Physical Environment Section 6.5 Predicted Effects on valued Components, specifically Sections 6.5.1.4 , 6.5.1.9 , 6.5.2.4 , 6.5.2.9 , 6.5.3.4 , 6.5.3.9 , 6.5.4.4 , 6.5.4.9 , 6.5.5.4 , 6.5.5.9 , 6.5.6.4 and 6.5.6.9 Section 6.6 Other Effects to Consider Chapter 7 Summary of Environmental Effects Assessment Section 10.1 Summary of the Potential Effects, Adverse Residual Effects and their Significance Appendix B Figures, specifically Figures 3 and 4 Appendix C Renderings Appendix E.1 Air Quality TDR, Sections 6.0 and 7.0 Appendix E.2 Channel Realignment TDR, Section 6.0 Appendix E.3 Cultural Heritage Assessment TDR,

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	<p>Section 6.5</p> <p>Appendix E.4 Fish and Fish Habitat TDR, Section 5.0</p> <p>Appendix E.5 Geotechnical Investigation, Section 10.0</p> <p>Appendix E.6 Hydrogeology TDR, Section 5.0</p> <p>Appendix E.7 Human Health Risk Assessment TDR, Sections 4.0, 5.0 and 6.0</p> <p>Appendix E.8 Light TDR, Section 5.2</p> <p>Appendix E.9 Baseline Ambient Noise Study TDR, Section 5.0</p> <p>Appendix E.10 Noise Effects Assessment TDR, Section 5.0</p> <p>Appendix E.12 Socio-Economic Baseline TDR, Section 5.0</p> <p>Appendix E.13 Soil Chemical Analysis TDR, Section 5.0</p> <p>Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 5.0</p> <p>Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment TDR, Section 6.0</p> <p>Appendix E.16 Terrestrial TDR, Section 5.0</p> <p>Appendix E.17 Review of Terminal-Generated Truck Traffic, Sections 6.2, 6.3 and 7.0</p> <p>Appendix E.18 Vibration Effects Assessment TDR, Section 5.0</p>
3.3.2 Valued Components to be examined	<p>Section 6.2.2 Selection of Valued Components</p> <p>Section 6.2.8 Potential Project-VC Interactions</p> <p>Section 6.5 Predicted Effects on Valued Components, specifically Sections 6.5.1.1, 6.5.1.3, 6.5.2.1, 6.5.2.3, 6.5.3.1, 6.5.3.3, 6.5.4.1, 6.5.4.3, 6.5.5.1, 6.5.5.3, 6.5.6.1 and 6.5.6.3</p>
3.3.3 Spatial and Temporal Boundaries	<p>Section 6.2.4 Identification of Spatial and Temporal EA Boundaries</p> <p>Section 6.5 Predicted Effects on Valued Components, specifically Sections 6.5.1.5, 6.5.2.5, 6.5.3.5, 6.5.4.5, 6.5.5.5 and 6.5.6.5</p> <p>Appendix B, Figure 6 Regional Assessment Areas</p> <p>Appendix E.1 Air Quality TDR, Section 3.2</p> <p>Appendix E.2 Channel Realignment TDR, Section 3.0</p> <p>Appendix E.3 Cultural Heritage Assessment TDR, Section 3.0</p> <p>Appendix E.4 Fish and Fish Habitat TDR, Section 3.0</p> <p>Appendix E.5 Geotechnical Investigation, Section 2.0</p> <p>Appendix E.6 Hydrogeology TDR, Section 1.2</p> <p>Appendix E.7 Human Health Risk Assessment TDR,</p>

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Section 2.2 Appendix E.8 Light TDR, Section 3.0 Appendix E.9 Baseline Ambient Noise Study TDR, Section 3.0 Appendix E.10 Noise Effects Assessment TDR, Section 3.0 Appendix E.12 Socio-Economic Baseline TDR, Section 3.0 Appendix E.13 Soil Chemical Analysis TDR, Section 3.0 Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 1.3 Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment TDR, Section 3.0 Appendix E.16 Terrestrial TDR, Section 3.0 Appendix E.18 Vibration Effects Assessment TDR, Section 3.0
4. Preparation and Presentation of the Environmental Impact Statement	
4.1 Guidance	Section 1.4.4 Policy and Guideline Documents Chapter 4 Community and Stakeholder Consultation Section 6.2.2 Selection of Valued Components, specifically Section 6.2.2.1 Section 6.5 Predicted Effects on Valued Components, specifically Sections 6.5.1.2 , 6.5.2.2 , 6.5.3.2 , 6.5.4.2 , 6.5.5.2 and 6.5.6.2 Appendix E.1 Air Quality TDR, Section 4.0 Appendix E.3 Cultural Heritage Assessment TDR, Section 4.2 Appendix E.4 Fish and Fish Habitat TDR, Section 1.3 Appendix E.11 Planning Justification Report, Sections 1.3 and 3 Appendix E.13 Soil Chemical Analysis TDR, Section 4.1 Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 7.0 Appendix E.16 Terrestrial TDR, Section 1.3
4.2 Study Strategy and methodology	Chapter 5 Aboriginal Engagement and Concerns Chapter 6 Effects Assessment Section 6.2 Methods Section 6.5 Predicted Effects on Valued Components Appendix E Technical Data Reports, including: Appendix E.1 Air Quality TDR, Section 3.0 Appendix E.2 Channel Realignment TDR, Section 5.0 Appendix E.3 Cultural Heritage Assessment TDR,

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	<p>Section 4.0</p> <p>Appendix E.4 Fish and Fish Habitat TDR, Section 4.0</p> <p>Appendix E.5 Geotechnical Investigation, Section 8.0</p> <p>Appendix E.6 Hydrogeology TDR, Section 3.0</p> <p>Appendix E.7 Human Health Risk Assessment TDR, Section 3.0</p> <p>Appendix E.8 Light TDR, Section 4.0</p> <p>Appendix E.9 Baseline Ambient Noise Study TDR, Section 4.0</p> <p>Appendix E.10 Noise Effects Assessment TDR, Section 4.0</p> <p>Appendix E.11 Planning Justification Report</p> <p>Appendix E.12 Socio-Economic Baseline TDR, Section 4.0</p> <p>Appendix E.13 Soil Chemical Analysis TDR, Section 4.0</p> <p>Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 3.0</p> <p>Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment TDR, Section 4.0</p> <p>Appendix E.16 Terrestrial TDR, Section 4.0</p> <p>Appendix E.17 Review of Terminal-Generated Truck Traffic</p> <p>Appendix E.18 Vibration Effects Assessment TDR, Section 4.0</p>
4.3 Use of information	
4.3.1 Scientific advice	<p>Chapter 4 Community and Stakeholder Consultation</p> <p>Section 6.3 Project Setting and Baseline Conditions</p> <p>Appendix D Record of Consultation, specifically Appendix D5 and D8</p> <p>Appendix E Technical Data Reports</p>
4.3.2 Community knowledge and Aboriginal traditional knowledge	<p>Chapter 4 Community and Stakeholder Consultation</p> <p>Chapter 5 Aboriginal Engagement and Concerns</p> <p>Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples</p> <p>Appendix D Record of Consultation</p>
4.3.3 Existing information	<p>Section 6.3 Project Setting and Baseline Conditions</p> <p>Section 6.5 Predicted Effects on Valued Components, specifically Sections 6.5.1.7, 6.5.2.7, 6.5.3.7, 6.5.4.7, 6.5.5.7 and 6.5.6.7</p> <p>Chapter 11 References</p> <p>Appendix E Technical Data Reports, including:</p> <p>Appendix E.1 Air Quality TDR, Section 5.0</p>

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Appendix E.2 Channel Realignment TDR, Section 4.0 Appendix E.3 Cultural Heritage Assessment TDR, Sections 5.0 and 6.0 Appendix E.4 Fish and Fish Habitat TDR, Section 5.0 Appendix E.5 Geotechnical Investigation, Section 9.0 Appendix E.6 Hydrogeology TDR, Section 4.0 Appendix E.7 Human Health Risk Assessment TDR, Section 2.3 Appendix E.8 Light TDR, Section 5.1 Appendix E.9 Baseline Ambient Noise Study TDR, Section 5.0 Appendix E.10 Noise Effects Assessment TDR, Section 4.2 Appendix E.11 Planning Justification Report Appendix E.12 Socio-Economic Baseline TDR, Section 5.0 Appendix E.13 Soil Chemical Analysis TDR, Section 5.0 Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 4.0 Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment TDR, Section 5.0 Appendix E.16 Terrestrial TDR, Section 5.0 Appendix E.17 Review of Terminal-Generated Truck Traffic, Section 2.0 Appendix E.18 Vibration Effects Assessment TDR, Section 5.0
4.3.4 Confidential information	Chapter 4 Community and Stakeholder Consultation Chapter 5 Aboriginal Engagement and Concerns Appendix D Record of Consultation (redacted private or sensitive information)
4.4 Presentation and organization of the Environmental Impact Statement	EIS Title Page Table of Contents List of Tables, Diagrams, Graphs and Photos List of Figures (Appendix B) Abbreviations and Glossary Section 1.6 EIS Organization and Content Section 1.7 Concordance with the EIS Guidelines Chapter 11 References
4.5 Summary of the Environmental Impact Statement	EIS Summary Document (English and French)
Part 2 – Content of the Environmental Impact Statement	
1. Introduction and Overview	Chapter 1 Introduction and Overview

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
1.1 The proponent	Section 1.1 The Proponent
1.2 Project Overview	Section 1.2 Project Overview
1.3 Project Location	Section 1.3 Project Location Appendix B Figures (all), specifically Figure 1 Regional Setting for the Project
1.4 Regulatory framework and the role of government	Section 1.4 Regulatory Framework and Role of Government Sections 6.5.1.2, 6.5.2.2, 6.5.3.2, 6.5.4.2, 6.5.5.2 and 6.5.6.2 Regulatory Setting Appendix E.1 Air Quality TDR, Section 4.0 Appendix E.3 Cultural Heritage Assessment TDR, Section 4.2 Appendix E.4 Fish and Fish Habitat TDR, Section 1.3 Appendix E.11 Planning Justification Report, Sections 1.3 and 3 Appendix E.13 Soil Chemical Analysis TDR, Section 4.1 Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 7.0 Appendix E.16 Terrestrial TDR, Section 1.3
2. Project Justification and Alternatives Considered	Chapter 2 Project Justification and Alternatives Considered Appendix B Figures, specifically Figure 2 Alternatives to Project Design Appendix E.11 Planning Justification Report Appendix E.12 Socio-Economic Baseline TDR Appendix E.17 Review of Terminal-Generated Truck Traffic Appendix F Site Selection Report
2.1 Purpose of the project	Section 2.1 Purpose of the Project Chapter 8 Benefits of the Project Appendix E.11 Planning Justification Report Appendix F Site Selection Report
2.2 Alternative means of carrying out the project	Section 2.2 Alternative Means of Carrying out the Project Appendix B Figures, specifically Figure 2 Alternatives to Project Design Appendix E.17 Review of Terminal-Generated Truck Traffic Appendix F Site Selection Report
3. Project Description	Chapter 3 Project Description
3.1 Project Components	Section 2.2.3 Key Project Components Section 3.3 Project Components Appendix B Figures, specifically Figure 3 Preliminary

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Design of the Milton Logistics Hub Site Plan Appendix C Renderings Appendix E Technical Data Reports, specifically Appendices E.2, E.10, E.11, E.12, E.13, E.15 and E.17
3.2 Project Activities	Section 3.4 Project Activities Section 3.6 Schedule Appendix E.10 Noise Effects Assessment TDR, specifically Section 4.3.2, Table 4.6 (pages 27 to 28) and TDR Appendix D Appendix E.17 Review of Terminal-Generated Truck Traffic
3.2.1 Site preparation and construction	Section 3.3.8 Clearing, Grading and Berms Section 3.3.9 Construction Materials and Stockpile Areas Section 3.3.10 Realignment of Indian Creek Section 3.3.11 Realignment of Tributary A Section 3.4.1 Construction Section 3.5 Employment Requirements Appendix E.2 Channel Realignment TDR
3.2.2 Operation	Section 3.3.5 Truck Entrance/Gate and Access Road Section 3.3.6 Administration Building and Maintenance Garage Section 3.3.7 Stormwater Management System Section 3.4.2 Operations Section 3.5 Employment Requirements Appendix E.1 Air Quality TDR Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment TDR, specifically Appendix B Appendix E.17 Review of Terminal-Generated Truck Traffic
4. Public Consultation and Concerns	Chapter 4 Community and Stakeholder Consultation Section 10.3 Summary of Public Engagement Appendix D Record of Consultation
<ul style="list-style-type: none"> Description of information and materials that were distributed during the consultation process 	Section 4.3 Stakeholder Consultation Activities Appendix D Record of Consultation
<ul style="list-style-type: none"> Methods used, where consultation held, persons and organizations consulted, concerns voiced, extent this information was incorporated into the design of the project 	Section 4.3 Stakeholder Consultation Activities Section 4.4 Summary of Stakeholder Comments Appendix D Record of Consultation
<ul style="list-style-type: none"> Summary of key issues raised related to the EA 	Section 4.4 Summary of Stakeholder Comments Table 4.3 Public and Interest Group Issues Table 4.4 Agency and Municipality Issues Appendix D Record of Consultation

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
<ul style="list-style-type: none"> Description of outstanding issues and ways to address them 	Section 4.4.1 Summary of Public and Interest Group Comments Section 4.4.2 Summary of Agency and Municipal Comments Section 4.5 Ongoing Future Consultation Appendix D Record of Consultation Appendix G Mitigation Measures and Commitments
5. Aboriginal Engagement and Concerns	Chapter 5 Aboriginal Engagement and Concerns Section 9.4.8 Aboriginal Peoples Section 10.4 Summary of Aboriginal Engagement Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> VCs suggested by Aboriginal groups for inclusion in the EIS, whether they were included, and the rationale for any exclusions 	Section 5.6 Summary of Views Expressed by Aboriginal Communities Section 6.2.2 Selection of Valued Components Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Section 6.5 Predicted Effects on Valued Components, specifically Sections 6.5.6.1 and 6.5.6.3 Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> Each group's potential or established rights, including maps and data sets 	Section 1.3 Project Location Section 5.4.5 Traditional Land Use Study Section 5.5 Aboriginal Community Profiles Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Appendix B Figures, specifically Figure 5 Aboriginal Reserves Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> The potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established Aboriginal or Treaty rights. 	Sections 5.6.1.2, 5.6.2.2, 5.6.3.2 and 5.6.4.2 Comments on Potential Adverse Impacts of the Project on Potential or Established Aboriginal or Treaty Rights Section 6.5 Predicted Effects on Valued Components Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> The measures identified to mitigate or accommodate potential adverse impacts of the project on the potential or established Aboriginal or Treaty rights 	Section 6.2.2 Selection of Valued Components Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Section 9.4.8 Aboriginal Peoples Section 10.4 Summary of Aboriginal Engagement Appendix G Mitigation Measures and Commitments

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
<ul style="list-style-type: none"> The effects of changes to the environment on Aboriginal peoples or potential adverse impacts on potential or established Aboriginal or Treaty rights that have not been fully mitigated or accommodated. 	Section 6.5 Predicted Effects on Valued Components
<ul style="list-style-type: none"> Specific suggestions raised by Aboriginal groups for mitigation or accommodation of measures 	Section 5.6 Summary of Views Expressed by Aboriginal Communities Section 6.3 Project Setting and Baseline Conditions Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> Views expressed by Aboriginal groups on the effectiveness of the mitigation or accommodation of measures 	Section 5.6 Summary of Views Expressed by Aboriginal Communities Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Appendix D Record of Consultation
<ul style="list-style-type: none"> Any potential cultural, social and/or economic impacts or benefits to Aboriginal groups 	Section 6.5 Predicted Effects on Valued Components Chapter 8 Benefits of the Project Appendix E.14 Stage 1-2 Archaeological Assessment TDR, Section 2.2 and 2.3
<ul style="list-style-type: none"> Comments, specific issues and concerns raised by Aboriginal groups and how the key concerns were responded to or addressed 	Section 5.6 Summary of Views Expressed by Aboriginal Communities Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Section 6.5 Predicted Effects on Valued Components Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> Changes made to the project design and implementation directly as a result of discussions with Aboriginal groups 	Section 3.7 Summary of Changes to the Project Design since filing with CEAA Appendix D Record of Consultation, specifically Appendix D7 and D8
<ul style="list-style-type: none"> Where and how Aboriginal traditional knowledge was incorporated into the environmental effects assessment 	Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Section 6.5 Predicted Effects on Valued Components
5.1 Aboriginal Groups to Engage & Engagement Activities	Section 1.3 Project Location Section 5.3 Identification of Aboriginal Communities Section 5.4 Aboriginal Community Engagement Section 5.6 Summary of Views Expressed by Aboriginal Communities Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Appendix D Record of Consultation
6. Effects Assessment	Chapter 6 Effects Assessment

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Appendix E Technical Data Reports
6.1 Project setting and baseline conditions	Section 6.3 Project Setting and Baseline Conditions Appendix E Technical Data Reports
6.1.1 Atmospheric Environment	Section 6.3.1 Atmospheric Environment Appendix E.1 Air Quality TDR Appendix E.8 Light TDR Appendix E.9 Baseline Ambient Noise Study TDR Appendix E.10 Noise Effects Assessment TDR
6.1.2 Geology and geochemistry	Section 6.3.2 Geology and Geochemistry Appendix E.5 Geotechnical Investigation TDR
6.1.3 Topography and soil	Section 6.3.3 Topography and Soil Appendix E.13 Soil Chemical Analysis TDR
6.1.4 Groundwater and Surface Water	Section 6.3.4 Groundwater and Surface Water Appendix E.2 Channel Realignment TDR Appendix E.6 Hydrogeology TDR Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment
6.1.5 Fish and Fish Habitat	Section 6.3.5 Fish and Fish Habitat Section 6.5.1.7 Existing Conditions Appendix E.4 Fish and Fish Habitat TDR
6.1.6 Migratory birds and their habitat	Section 6.3.6 Migratory Birds and their Habitat Section 6.5.2.7 Existing Conditions Appendix E.16 Terrestrial TDR
6.1.7 Species at Risk	Section 6.3.7 Species at Risk Section 6.5.3.7 Existing Conditions Appendix E.16 Terrestrial TDR
6.1.8 Aboriginal Peoples	Section 5.5. Aboriginal Community Profiles Section 5.6 Summary of Views Expressed by Aboriginal Communities Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples
6.1.9 Other Environmental Changes Arising as a Result of a Federal Decision or Authorization	N/A
6.1.10 Human Environment	Section 6.3.9 Socio-Economic Conditions Section 6.3.10 Health Conditions Section 6.3.11 Cultural Heritage Resources Section 6.3.12 Archaeology Section 6.3.13 Paleontology Section 6.5.4.7 Existing Conditions Section 6.5.5.7 Existing Conditions Section 6.5.6.7 Existing Conditions Appendix E.3 Cultural Heritage Assessment TDR

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Appendix E.7 Human Health Risk Assessment TDR Appendix E.11 Planning Justification Report Appendix E.12 Socio-Economic Baseline TDR Appendix E.14 Stage 1-2 Archaeological Assessment TDR Appendix E.17 Review of Terminal-Generated Truck Traffic
6.2 Predicted Changes to the Physical Environment	Section 6.4 Predicted Changes to the Physical Environment Appendix E Technical Data Reports
6.2.1 Changes to the Atmospheric Environment	Section 6.4.1 Changes to the Atmospheric Environment Appendix E.1 Air Quality TDR Appendix E.8 Light TDR Appendix E.9 Baseline Ambient Noise Study TDR Appendix E.10 Noise Effects Assessment TDR Appendix E.18 Vibration Effects Assessment TDR
6.2.2 Changes to Groundwater and Surface Water	Section 6.4.2 Changes to Groundwater and Surface Water Appendix B Figures, specifically Figure 4 Preliminary Watercourse Realignment and Naturalization Appendix E.2 Channel Realignment TDR Appendix E.6 Hydrogeology TDR Appendix E.15 Hydrology and Surface Water Quality Baseline Study and Effects Assessment
6.2.3 Changes to Terrestrial Landscape	Section 6.4.3 Changes to Terrestrial Landscape Appendix E.16 Terrestrial TDR
6.3 Predicted Effects on Valued Components	Section 6.5 Predicted Effects on Valued Components
6.3.1 Fish and Fish Habitat	Section 6.5.1 Fish and Fish Habitat Section 6.6.1.1 Assessment of Cumulative Environmental Effects on Fish and Fish Habitat Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Appendix E.4 Fish and Fish Habitat TDR
6.3.2 Migratory Birds	Section 6.5.2 Migratory Birds Section 6.6.1.2 Assessment of Cumulative Environmental Effects on Migratory Birds Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Appendix E.16 Terrestrial TDR
6.3.3 Species at Risk	Section 6.5.3 Species at Risk Section 6.6.1.3 Assessment of Cumulative Environmental Effects on Species at Risk

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Appendix E.16 Terrestrial TDR
6.3.4 Aboriginal Peoples	Section 6.2.2 Selection of Valued Components Section 6.3.8 Traditional Land and Resource Use for Aboriginal Peoples Section 6.5.4 Human Health Section 6.5.5 Socio-Economic Conditions Section 6.6.1.4 Assessment of Cumulative Environmental Effects on Human Health Section 6.6.1.5 Assessment of Cumulative Environmental Effects on Socio-Economic Conditions Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Appendix E.7 Human Health Risk Assessment TDR Appendix E.12 Socio-Economic Baseline TDR
6.3.5 Other Socio-Economic conditions and Heritage Resources	Section 6.5.4 Human Health Section 6.5.5 Socio-Economic Conditions Section 6.5.6 Archaeological and Heritage Resources Section 6.6.1.4 Assessment of Cumulative Environmental Effects on Human Health Section 6.6.1.5 Assessment of Cumulative Environmental Effects on Socio-Economic Conditions Section 6.6.1.6 Assessment of Cumulative Environmental Effects on Archaeological or Heritage Resources Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Appendix E.7 Human Health Risk Assessment TDR Appendix E.12 Socio-Economic Baseline TDR Appendix E.14 Stage 1-2 Archaeological Assessment TDR
6.4 Mitigation	Section 6.5.1.9 Assessment of Residual Environmental Effects on Fish and Fish Habitat Section 6.5.2.9 Assessment of Residual Environmental Effects on Migratory Birds Section 6.5.3.9 Assessment of Residual Environmental Effects on Species at Risk Section 6.5.4.9 Assessment of Residual Environmental Effects on Human Health Section 6.5.5.9 Assessment of Residual Environmental Effects on Socio-Economic Conditions Section 6.5.6.9 Assessment of Residual

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Environmental Effects on Archaeological and Heritage Resources Section 6.6 Other Effects to Consider Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Section 9.8 Environmental Management Plan Appendix G Mitigation Measures and Commitments
6.5 Significance of residual effects	Section 6.2.5 Characterization of Residual Project-related Environmental Effects Section 6.2.6 Thresholds or Benchmarks for Characterizing and Determining the Significance of Residual Environmental Effects Sections 6.5.1.6, 6.5.2.6, 6.5.3.6, 6.5.4.6, 6.5.5.6 and 6.5.6.6 Criteria for Characterizing Residual Environmental Effects and Thresholds for Determining Significance Section 6.5.1.9 Assessment of Residual Environmental Effects on Fish and Fish Habitat Section 6.5.2.9 Assessment of Residual Environmental Effects on Migratory Birds Section 6.5.3.9 Assessment of Residual Environmental Effects on Species at Risk Section 6.5.4.9 Assessment of Residual Environmental Effects on Human Health Section 6.5.5.9 Assessment of Residual Environmental Effects on Socio-Economic Conditions Section 6.5.6.9 Assessment of Residual Environmental Effects on Archaeological or Heritage Resources Section 6.6 Other Effects to Consider Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Section 10.1.2 Residual, Accidental and Cumulative Environmental Effects
6.6 Other effects to consider	Section 6.6 Other Effects to Consider
6.6.1 Effects of potential accidents or malfunctions	Section 6.2.11 Assessment of Potential Accidents or Malfunctions Section 6.6.2 Effects of Potential Accidents or Malfunctions Section 10.1.2 Residual, Accidental and Cumulative Environmental Effects
6.6.2 Effects of the environment on the project	Section 6.2.12 Assessment of Effects of the Environment on the Project Section 6.6.3 Effects of the Environment on the Project Section 10.1.2 Residual, Accidental and Cumulative

Amended Table 1.2: Guidelines for the Preparation of an EIS - Concordance Table

The Guidelines	EIS Reference
	Environmental Effects
6.6.3 Cumulative effects assessment	Section 6.2.10 Assessment of Cumulative Effects Section 6.6.1.1 Assessment of Cumulative Environmental Effects on Fish and Fish Habitat Section 6.6.1.2 Assessment of Cumulative Environmental Effects on Migratory Birds Section 6.6.1.3 Assessment of Cumulative Environmental Effects on Species at Risk Section 6.6.1.4 Assessment of Cumulative Environmental Effects on Human Health Section 6.6.1.5 Assessment of Cumulative Environmental Effects on Socio-Economic Conditions Section 6.6.1.6 Assessment of Cumulative Environmental Effects on Archaeological or Heritage Resources Section 10.1.2 Residual, Accidental and Cumulative Environmental Effects Appendix B Figures, specifically Figure 7 Projects Considered for Cumulative Effects
7. Summary of Environmental Effects Assessment	Chapter 7 Summary of Environmental Effects Assessment, specifically Table 7.1 Appendix G Mitigation Measures and Commitments
8. Follow-up and Monitoring Programs	Chapter 9 Follow-up and Monitoring Programs Section 10.2 Summary of Mitigation, Monitoring and Follow-up Commitments
8.1 Follow-up Program	Section 9.4 Follow-up Programs Section 10.2 Summary of Mitigation, Monitoring and Follow-up Commitments Appendix G Mitigation Measures and Commitments
8.2 Monitoring	Section 9.5 Monitoring Program Section 9.6 Reporting Section 10.2 Summary of Mitigation, Monitoring and Follow-up Commitments Appendix G Mitigation Measures and Commitments

ATTACHMENT IR2 – AMENDED EIS TABLES

*ATTACHMENT IR2 - AMENDED TABLE 6.21:
POTENTIAL PROJECT - ENVIRONMENTAL
INTERACTIONS AND EFFECTS ON
MIGRATORY BIRDS*

Amended Table 6.21: Potential Project - Environmental Interactions and Effects on Migratory Birds

Project Components and Physical Activities	Potential Environmental Effects		
	Change in Migratory Bird Mortality	Change in Migratory Bird Habitat	Sensory Disturbance of Migratory Birds
Construction			
Site Preparation and Grading Activities	✓	✓	-
Track Construction and Signals Installation	-	✓	-
Terminal Infrastructure	-	-	-
Grade Separations	-	✓	-
Utilities	-	✓	-
Watercourse Realignment, Restoration and Naturalization	✓	✓	-
Construction Equipment and Operation	✓	✓	-
Air Contaminant Emissions	-	-	-
Acoustic Emissions	-	✓	-
Solid Waste Management and Recycling	-	-	-
Operations			
Truck Entrance/Exit (Gate)	✓	✓	-
Train Operations	✓	✓	-
Lift Operations	-	✓	-
Equipment Maintenance	-	✓	-
Water Management	✓	-	-
Site Buildings, Linear Facilities and Associated Infrastructure	✓	-	✓
Operation Labour Requirements	-	✓	-
Air Contaminant Emissions	-	-	-
Acoustic Emissions	-	✓	-
Solid Waste Management and Recycling	-	-	-

Notes:

✓ = Potential interactions that might cause an effect.

- = Interactions between the project and the VC are not expected.

*ATTACHMENT IR2 - AMENDED TABLE 6.25:
POTENTIAL PROJECT ENVIRONMENTAL
INTERACTIONS AND EFFECTS ON SPECIES
AT RISK PROJECT COMPONENTS AND
PHYSICAL ACTIVITIES*

Amended Table 6.25: Potential Project Environmental Interactions and Effects on Species at Risk Project Components and Physical Activities

Project Components and Physical Activities	Potential Environmental Effects	
	Changes in direct mortality to SAR	Change to critical habitat of SAR
Construction		
Site Preparation	✓	✓
Track Construction and Signals Installation	✓	-
Terminal Infrastructure	-	-
Grade Separations	✓	-
Utilities	✓	-
Watercourse Realignments, Restoration and Naturalization	✓	-
Construction Equipment and Operation	✓	✓
Air Contaminant Emissions	-	-
Acoustic Emissions	-	✓
Solid Waste Management and Recycling	-	-
Operations		
Truck Entrance/Exit (Gate)	✓	-
Train Operations	✓	-
Lift Operations	-	-
Equipment Maintenance	-	-
Water Management	-	✓
Site Buildings, Linear Facilities and Associated Infrastructure	-	-
Operation Labour Requirements	-	✓
Air Contaminant Emissions	-	-
Acoustic Emissions	-	✓
Solid Waste Management and Recycling	-	-

Notes:

✓ = Potential interactions that might cause an effect.

- = Interactions between the project and the VC are not expected.

*ATTACHMENT IR2 - AMENDED TABLE 7.1:
SUMMARY OF ENVIRONMENTAL EFFECTS
ASSESSMENT*

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
Fish and Fish Habitat														
Change in fish habitat	5(1)(a)(i)	✓	✓	<ul style="list-style-type: none">Alteration or removal of habitat or riparian vegetation (including critical habitat of SAR) during construction of water management facilities/buildings/ infrastructure and watercourse realignmentsTemporary or longer-term degradation of habitat quality from increased sediment input (and sediment load)Reduction of cover through removal of riparian vegetation may, increase water temperature and negatively affect invertebrate populations.	<p>Realign and reconstruct Tributary A and Indian Creek and incorporate habitat offset</p> <ul style="list-style-type: none">Direct measures in PDA:<ul style="list-style-type: none">Natural channel design (including natural bed morphology, planform geometry) incorporating 2,400 m² of new channelAn increase in diversity of habitat types – e.g., grass spawning areas with suitable hydrology to permit egg deposition, maturation and movement of YOY back to the main branchIndirect measures in PDA, LAA, and RAA:<ul style="list-style-type: none">Riparian cover along the watercourse (decreased average water temperature, increased bank stability, increased cover, increased and more diversified allochthonous inputs)Improved habitat conditions to facilitate the future re-establishment of Silver Shiner (SAR)Potential operational effects will be mitigated through successful implementation of the SWM plan.	<ul style="list-style-type: none">Tributary A to Indian Creek:<ul style="list-style-type: none">Net loss of approximately 2,800 m² of low quality fish habitat for YOY Largemouth Bass and White Sucker and small bodied fishReduction in rearing and foraging habitat, except for White Sucker where spawning habitat conditions are not presentReduction in productive capacity of the CRA fishery within the PDA. Further offsetting will occur following a discussion with DFO. Implementation of the final offsetting plan will result in there being no significant residual effects to a CRA fishery in Tributary ATributary C to Indian Creek<ul style="list-style-type: none">The installation of approximately a 30 m long culvert on this feature will result in the alteration of poorly defined channel the contributes indirectly to fish habitat, or supports fish habitat during spring freshet	N	N	RAA	LT	C	I	D	Not Significant
Change in fish movement, migration and fish passage	5(1)(a)(i)	✓	✓	<ul style="list-style-type: none">Fish migration and movement passages may temporarily be partially or completely blocked during removal of earthen plugs to change flow of realignmentsAcoustic emissions associated with construction may alter fish behaviour, affecting movement patterns by causing fish to temporarily avoid or move out of the PDA and LAA.	<ul style="list-style-type: none">New channel will be constructed in the dry, while leaving earthen plugs at the connection points.Maintain downstream flow at all times when conducting in-water construction activities.Ensure water and pump intakes reduce or avoid disturbance of the watercourse bed and are screened with a maximum mesh size consistent with DFO's Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 1995).	<ul style="list-style-type: none">The use of mitigation measures and removal of temporary blockage from periods of channel realignment immediately following construction will mean that there will be no change in fish movement, migration, or fish passage as a result of Project-related activities.	N	L	PDA	ST	IR	R	D	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
Change in fish mortality	5(1)(a)(i)	✓	-	<ul style="list-style-type: none">• Potential increased mortality during construction and channel realignment, restoration, and naturalization from direct in-water• Potential for fish mortality by the introduction of a deleterious substance	<ul style="list-style-type: none">• Project personnel are not permitted to fish on the work site.• Where required, conduct a fish salvage led by a qualified aquatic biologist.• Release all captured fish to areas within the same watercourse, outside of the work area, where suitable habitat exists.• Activities near water should be carried out following standard guidance that reduce effects on fish and fish habitat.	The use of mitigation measures will limit the effects of the construction on fish mortality, such that adverse environmental effects are likely to be low.	A	L	LAA	ST	IR	R	D	Not Significant
Change in water quality	5(1)(a)(i)	✓	✓	<ul style="list-style-type: none">• Potential to induce a wide range of biological effects, including behavioural changes in fish, sub-lethal effects, and fish mortality.• Reduce overall fish production in a watercourse or water body due to turbidity-related reductions in algae and in benthic and aquatic invertebrate production.• Smothering of benthic invertebrate communities or fish eggs and larvae from suspended sediment settling when water velocities slow.	<ul style="list-style-type: none">• Establish and clearly identify a riparian buffer. Restrict disturbance to allow only activities associated with realignment, restoration, and naturalization.• Install erosion and sediment control at appropriate locations adjacent to all watercourses, or as directed by the Environmental Monitor(s).• When implementing erosion and sediment control mitigation is not practicable (e.g., due to weather conditions), reduce the number of vehicles on access roads or cleared work areas to limit erosion risks.• Ensure that grubbing, stripping and grading on approach slopes to watercourses is restricted to an amount required to allow the safe passage of equipment and completion of the relevant work.• Develop water quality monitoring plans to monitor for sediment release events during in-water construction activities and implement corrective actions. Corrective actions are not successful, construction activities will be temporarily suspended until effective solutions are identified.• Ensure water from flumes, dams and pumps do not cause erosion or introduce sediment into the channel.• For dewatering activities, pump water onto stable, well vegetated areas, tarpaulins, sheeting, rocks, sand bags, or into settling ponds, filter bags, or other appropriate sediment filtering devices, as determined by the Environmental Monitor(s) or the mitigation	<ul style="list-style-type: none">• Localized, positive changes to surface water and sediment quality with respect to in-water concentrations of sediment, nutrients, metals and hydrocarbons within Tributary A and Indian Creek.• Following project completion, a low magnitude increase in water quality is expected through construction of SWM facilities and channel alteration/riparian enhancements.• Change in water quality from the introduction of hydrocarbons or other deleterious substances related to equipment use is expected to be low• Change in water quality from introduction of hydrocarbons or other deleterious substances from construction activities is expected to be low	P	L	LAA	LT	C	I	D	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEEA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
					plan. Complete dewatering in a manner that does not cause erosion or allow sediment to re-enter a watercourse. <ul style="list-style-type: none">Collect and treat all storm water and surface runoff within the Terminal site and release to Indian Creek or Tributary									
Migratory Birds														
Change in migratory bird mortality	5(1)(a)(iii)	✓	✓	<ul style="list-style-type: none">Bird mortality could occur during the site preparation and watercourse realignment, including removing vegetation, clearing trees, grubbing, and blasting (e.g., bird fatalities through nest destruction).Bird mortality from vehicular collisions due to increased construction equipment and operation activities in and around the Project.Mortality of migratory birds during operations from SWM facilities, in the event they encounter floating hydrocarbons.Site buildings and associated infrastructure pose the potential risk of migratory bird collisions.	<ul style="list-style-type: none">Construction activities with the potential to remove migratory bird habitat, outside of the breeding season (March to end of August in this region)Should vegetation clearing activities be unavoidable during this window, conduct nest sweeps and avoidance of clearing during key sensitive periods and in key locations;Provide a wildlife education program for employees so they can respond appropriately to bird encounters;Speed limits should be implemented and enforced on internal roads;Pre-treatment of water run-off before discharge to SWM ponds, including installation of oil grit separator;A Spill Response Plan should be developed and implemented to contain contamination, including shut-off valves on SWM pondsIn the event a SWM pond becomes contaminated with a spill, bird deterrents should be implemented to prevent use of the pond until cleanup measures have been completed;To reduce the risk of collision with Project infrastructure, Project lighting used to illuminate the Terminal should be as efficient as possible,Implement BMPs including locating vegetation or greenery away from glass to minimize risk of avian collision with windows, (refer to the Bird Friendly Development Guidelines, City of Toronto 2007).	<ul style="list-style-type: none">Migratory bird mortality in the LAA during construction is expected to be low though mitigation implementation.During operation, it is expected that birds will avoid vehicular traffic in the area, based on limited suitable habitat availability and changes in bird mortality in the LAA should be low.Bird mortality during operation, including SWM pond contamination and strikes with buildings and infrastructure, should be greatly reduced through applicable mitigation measures and should not result in any reduction in species diversity within the LAA.	A	L	PDA	P	R	R	D	Not Significant
Change in migratory birds use of area	5(1)(a)(iii)	✓	✓	<ul style="list-style-type: none">Loss or alteration of terrestrial habitat.Displacement of some migratory bird residences.	<ul style="list-style-type: none">The project footprint will be minimized, whereby unnecessary vegetation clearing around facility, access roads and rail will be avoided wherever practicable.	<ul style="list-style-type: none">Implementation of applicable mitigation measures is expected to reduce or eliminate any change in use of migratory bird	A	L	LAA	P	C	I	D	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
				<ul style="list-style-type: none">No changes in use of migratory bird habitat are anticipated due to fragmentation.Construction noise may cause a change in migratory bird use within the LAA.Birds nesting near construction areas may abandon their nests.Acoustic emissions during operation may result in changes to habitat use.Disturbance from human presence may result in indirect disturbance to adjacent migratory bird habitat use during operation.	<ul style="list-style-type: none">Enhancement and creation of wetlands within the LAA to improve breeding opportunities for wetland birds.Offsite grassland habitat will be created to offset loss of grassland habitat on-site.Construction work areas will be demarcated to avoid incidental encroachment.Natural vegetation along the boundaries of the Project will be retained to provide noise buffersConstruction and operations equipment will be maintained in good order (e.g., mufflers);Project layout will be designed to avoid effects on natural features, including:<ul style="list-style-type: none">Trafalgar Moraine Earth Science ANSI;North Oakville-Milton West Wetland Complex; and,Protected Countryside land use designation under the Greenbelt Plan.Provide a wildlife education program for employees so they can respond appropriately to bird encounters.	<ul style="list-style-type: none">habitat.Grassland offsets measures will be implemented to result in no net loss of habitat.Disturbance impacts during construction may result in a decrease in bird density, however, this is likely to be short term in nature and be restricted to the two year construction period.Change in acoustic emissions at grassland and forest habitats within the LAA from baseline conditions expected to be low.								
Sensory Disturbance	5(1)(a)(iii)	✓	✓	<ul style="list-style-type: none">Artificial lighting may create sensory disturbance to migratory landbirds by influencing bird behaviour.Within the PDA, any project components that are lit at night have the potential to attract birds, including buildings, light standards or other external lights.	<ul style="list-style-type: none">Project lighting used to illuminate the Terminal should be as efficient as possible, while providing enough light to make the site safe and secure at night.Light fixtures will project light downward to minimize light spillage beyond the PDA.During construction, use of site flood lighting will be limited during the migration periods.	<ul style="list-style-type: none">The construction and operation of the Project facility could result in sensory disturbance to migrating birds throughAttraction to Project lighting, however the effect is anticipated to be minimized with the implementation of mitigation measures.	A	L	RAA	P	R	R	D	Not Significant
Species at Risk														
Change in Species at Risk Mortality	5(1)(a)(ii) and 5(2)(a)	✓	✓	<ul style="list-style-type: none">No mortality to Western Chorus Frog is anticipated during construction of the Project.Low risk of mortality to Western Chorus Frog in the event of future occupation of critical habitat within the LAA.No bird, fish, amphibian, mammal or	<ul style="list-style-type: none">Construction activities with the potential to remove residences of Bobolink, Eastern Meadowlark or Barn Swallow such as vegetation clearing or barn removal should be avoided during the breeding season (end of March to end of August).Provide a wildlife education program for	<ul style="list-style-type: none">Mortality of Western Chorus Frog are anticipated to be very low to negligible.During construction, the implementation of timing windows for site preparation and reduced vehicle speeds is anticipated to	A	L	PDA	P	IR	R	D	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
				<p>reptile Schedule 1 SAR found within the PDA.</p> <ul style="list-style-type: none">• Potential for mortality of bird SAR during the site preparation, including removing vegetation, clearing trees, and grubbing (e.g., fatalities through nest destruction).• Low risk of grassland breeding bird mortality during operation due to collisions with vehicular traffic.• During construction, potential for Snapping Turtle mortality during in-water works.• Increased risk of mortality to Snapping Turtle during construction and operation from vehicular traffic.• No anticipated risk of mortality to the Eastern Wood-Pewee or Little Brown Myotis.	<p>employees so they can respond appropriately to bird encounters;</p> <ul style="list-style-type: none">• Speed limits should be implemented and enforced on internal roads.• Where applicable conduct turtle rescues to relocate Snapping Turtles before in water works and install exclusionary fencing to prevent individuals from entering the construction zone.• Avoid construction in-water during Snapping Turtles overwintering period from October to April.• Permanent exclusionary fencing around retained/enhanced turtle habitat to avoid interactions with turtles and Project vehicular traffic.	<p>result in a low risk of mortality in the LAA.</p> <ul style="list-style-type: none">• It is expected that birds will avoid vehicular traffic in the area during operation, and mortality of bird SAR in the LAA will be low.• Very low to negligible risk of Snapping Turtle mortality during construction with the implementation of mitigation measures.• Low risk of vehicular collision with Snapping Turtles with implementation of mitigation measures.								
Change in Species at Risk Critical Habitat and Residences	5(1)(a)(ii) and 5(2) (a)	✓	✓	<ul style="list-style-type: none">• Occurrence of Western Chorus Frogs critical habitat in the LAA and indirect acoustic emissions from Project operations may occur• Removal of Bobolink and Eastern Meadowlark habitat during construction and displacement of the residence of these species within the PDA.• Removals of any barns within the PDA will displace Barn Swallow residence.• Changes in water levels or water quality may affect the overwintering or summer life cycles of Snapping Turtle.• During construction, human activity will occur in Snapping Turtle habitat, which is anticipated to result in temporary disturbance in portions of the habitat within the PDA.	<ul style="list-style-type: none">• Minimize project footprint: avoid all unnecessary vegetation clearing around facility, access roads and rail wherever and whenever practicable.• Demarcate construction work areas to avoid incidental encroachment into adjacent areas.• Implement turtle habitat enhancements in Indian Creek and onsite ponds.• Create/protect offsite grassland habitat as offsets for loss of Bobolink and Eastern Meadowlark residences.• Retain natural vegetation along the boundaries of the Project to provide noise buffers and to limit noise associated with clearing.• Retain natural vegetation along the boundaries of the Project to provide noise buffers and to limit noise associated with clearing.• Maintain construction and operations equipment in good order (e.g., mufflers).• Where permissible under safety and	<ul style="list-style-type: none">• Construction and operation of the Project is not anticipated to directly affect critical habitat for SAR.• Indirect affects during construction and operation to Western Chorus Frog should be negligible with mitigation.• Habitat offsets will offset direct effects of the Project on the residences of Bobolink, Eastern Meadowlark.• Residence of the Snapping Turtle will be temporary disturbed during construction of the Project. However, with mitigation and enhancement measures, the residences are anticipated to continue to be used during operation of the Project.• Effects to the woodland habitat, which contain residences of Eastern Wood Pewee and Little	A	L	LAA	P	C	IR	D	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
					<p>navigation requirements, outdoor lights will be shielded to minimize light spillage beyond the required areas.</p> <ul style="list-style-type: none">Provide a wildlife education program for employees so they can respond appropriately to turtle encounters.	<p>Brown Myotis are anticipated to be very low to negligible.</p> <ul style="list-style-type: none">Indirect effects on woodland habitat are through acoustic emission expected to be negligible.								
Human Health														
Change in human health	5(2)(b)	✓	✓	<ul style="list-style-type: none">Change in human health from short-term and long-term exposure via inhalation of chemicals from air emission sources during construction and operation phases. Primary Air emissions sources are expected to be from mobile or stationery equipment discharging emissions from combustion of fuel (e.g., gasoline, etc.). Mobile emission sources include locomotives, trucks, non-road equipment. Stationary emissions sources include the three future powerpack generators and one clip-on generatorChange in human health from exposure to fugitive dust emissions from road traffic during movement of mobile equipment (e.g., trucks).	<ul style="list-style-type: none">BMPs to reduce CAC, HAP and GHG emissions will be incorporated into Project design wherever possible.Dust will be controlled through the use of dust suppressants (i.e., water, not oil), minimizing the area of activity, minimizing activities that generate large quantities of dust during high winds, covering truck loads of materials which could generate dust (as necessary), and paving areas as required.Materials stored on-site will be covered or wetted to prevent blowing dust, where practicable.Access and onsite roads will be watered as required to control fugitive dust emissions.	<ul style="list-style-type: none">The implementation of applicable mitigation measures is expected to reduce potential human exposures to COPCs related to the construction and operation of the Project	A	N	LAA	P	IR	R	D	Not Significant
Socio-Economic Conditions														
Change in Demand for Community Services and Infrastructure	5(2)(b)	✓	✓	<ul style="list-style-type: none">Temporary land closures or detours during construction may affect road users (e.g., motor vehicle operators, cyclists and others).	<ul style="list-style-type: none">Prior to initiating construction activities, the Proponent will use community media outlets such as newspapers and radio stations, and email updates, to announce the location and schedule of construction activities.CN will cooperate with the Town of Milton to provide an underpass at Lower Base Line	<ul style="list-style-type: none">Road users may experience some level of inconvenience during construction.Once construction is completed, there will be a positive residual effect on vehicle movement compared to baseline conditions	A, P	L	LAA	ST, P	C	R, IR	HR	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
					(road will cross beneath the existing mainline).	by reducing existing sources of road delays from train crossings.								
Change in the Quantity and Quality of Land and Resource Use	5(2)(b)	✓	✓	<ul style="list-style-type: none">Loss of agricultural land 31 ha or 0.1% of the total agricultural land within the RAA).Presence of the Project, including associated acoustic and atmospheric emissions may:<ul style="list-style-type: none">reduce the quality of land use for users within the LAA;change the views of the landscape; and,reduce the quality of experience for cyclists in the region.	<ul style="list-style-type: none">CN will work with the Halton Region and agricultural operators with leases to farm lands on CN property to mitigate the loss of agricultural areas. Mitigation measures may include rehabilitation or improvement of adjacent lands or providing a contribution to agricultural research in the area.As per Project design, berms will be constructed in key locations around the PDA and planted with trees and shrubs consistent with the existing environment to provide barriers to noise emissions and viewscapes of the site.	<ul style="list-style-type: none">Loss of agricultural land is 31ha, land use is of appropriate designation, therefore the magnitude of this interaction is lowAcceptable levels of acoustic and atmospheric emissions and light for recreational use.	A	L	LAA	P	C	IR	D	Not Significant
Archaeological and Heritage Resources														
Unauthorized disturbance or destruction of part or all of an archaeological site or sites	5(1)(c) and 5(2)(b)	✓	-	<ul style="list-style-type: none">Site preparation and grading activities of trees, brush and other ground cover may cause disturbances to archaeological resources as the roots pull up soil and can cause displacement of artifacts and destroy features in archaeological sitesRemoval of vegetation can result in unstable soil conditions and could result in movement of artifacts and the soil matrix.Root disturbance during watercourse realignment, restoration and naturalization could displace artifacts or destroy features in archaeological sitesGrading, excavation and removal of soils associated with the construction of roads, berms, yard tracks, storm water management facilities and buildings could cause disturbance and/ or removal of archaeological resources.Disturbance to soil from grade separation construction (involves temporary relocation of tracks) and	<ul style="list-style-type: none">Complete a Stage 3 archaeological assessment on the 14 sites recommended prior to Project development. This assessment will be completed to delineate the extent of an archaeological site and, if possible, further refine understanding of the age and/or cultural affiliation and will establish mitigation measures for each site.Avoid and protect the resource(s) wherever possible by excluding the archaeological site from the Project, or incorporating the area into the Project (but without alteration) and install a protective barrier around the site and buffer zoneIf avoidance and protection of archaeological resources is not feasible then controlled salvage excavations of the archaeological resources, or parts thereof as applicable, will be required following the requirements as outlined in the MTCS <i>Standards and Guidelines for Consultant Archaeologist</i>Implement an Archaeological Resources Protection Plan.Conduct construction monitoring in areas in proximity to known archaeological resources.Implement a worker education program	<ul style="list-style-type: none">Project specific environmental effects on archaeological resources are continually mitigated to the standards established by the province. After implementation of the required mitigation measures issued by the regulatory agency, there will be no residual environmental effects.With the accumulation of new knowledge from the archaeological assessment and follow-up work, the residual effect of the project on archaeological resources could be considered as Positive	N, P	N	PDA	P	S	I	D, U, NR	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
				utility installation/relocation could lead to unstable soil conditions and movement of artifacts and/or destruction of archaeological resources.	<p>about appropriate protocols in case of accidental discoveries.</p> <ul style="list-style-type: none">• Conduct further assessment of changes to the PDA.• If an archaeological resource is discovered during the construction phase, all construction will cease within a 20 m radius of the archaeological resource. In the event of a chance find, CN will stop work immediately and contact MTCS prior to the implementation of procedures and mitigation as required under the <i>Ontario Heritage Act</i> and the 2011 <i>Standards and Guidelines</i> (Government of Ontario 2011). A licensed archaeologist will be retained by CN and a Stage 2 Archaeological Assessment will be conducted with the participation of any interested Aboriginal groups. Follow-up Stage 3 or Stage 4 archaeological investigations will be conducted as required.• Train key construction staff in the recognition of basic archaeological artifacts such as Aboriginal material culture (e.g., clay ceramics, lithic artifacts, and faunal remains), and Euro-Canadian material culture (e.g., refined ceramics, glassware, construction debris, and personal effects).• If human remains are encountered, CN will stop work immediately and contact the police or coroner, registrar or Deputy Registrar of the Cemeteries Regulation Section of the Ontario Ministry of Government and Consumer Services, as well as the Archaeology Programs Unit.									
Unauthorized disturbance or destruction of part or all of a heritage resource	5(2)(b)	✓	-	<ul style="list-style-type: none">• Land disturbances during the construction phase of the project (site preparation and grading activities, grade separations, utilities, watercourse realignment, restoration and naturalization, and construction equipment and operation) may result in the removal of resources of cultural heritage value and interest.	<ul style="list-style-type: none">• Follow MTCS suggested methods to minimize or avoid negative direct or indirect effects including (Government of Ontario 2006), but not limited to:<ul style="list-style-type: none">◦ Alternative development approaches;◦ Isolating development and site alteration from significant built and natural features and vistas;◦ Design guidelines that harmonize mass,	<ul style="list-style-type: none">• With the mitigation measure of a 50 m buffer around the resource, the effects from indirect vibration will be negligible.• Areas where a structure will be removed (e.g., 5269 Tremaine Road (CHR-4)), mitigation measures will document and salvage the resource	N	N	PDA	P	S	I	D, U, NR	Not Significant

Amended Table 7.1: Summary of Environmental Effects Assessment

VC Affected	Area of Federal Jurisdiction from CEAA, 2012	Project Phase		Potential Effects	Proposed Mitigation	Residual Effect	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context	Significance of Residual Adverse Effect
		Construction	Operation											
				<ul style="list-style-type: none">Construction activities may cause vibration effects on cultural heritage resources within 50 m of the construction activities in the PDA.	<ul style="list-style-type: none">setback, setting, and materials;<ul style="list-style-type: none">Limiting height and density;Allowing only compatible infill and additions;Reversible alterations; and,Buffer zones, resource protection measures, and other planning mechanisms.Avoid interactions with indirect effects from vibration through the use barriers around a 50 m protective buffer zone.For direct effects, mitigation should take the form of relocation or documentation and salvage.	<ul style="list-style-type: none">As project specific environmental effects on heritage resources are continually mitigated to the standards established by the province, after implementation of the required mitigation measures issued by the regulatory agency, there will be no residual environmental effects, from the Project								

KEY

See Chapter 6 for detailed definitions

Project Phase

C: Construction

O: Operation

Direction:

P: Positive

A: Adverse

N: Neutral

Magnitude:

N: Negligible

L: Low

M: Moderate

H: High

Geographic Extent:

PDA: Project Development Area

LAA: Local assessment area

RAA: Regional assessment area

Duration:

ST: Short-term;

MT: Medium-term

LT: Long-term

P: Permanent

NA: Not applicable

Frequency:

S: Single event

IR: Irregular event

R: Regular event

C: Continuous

Reversibility:

R: Reversible

I: Irreversible

Socio-Economic Context:

D: Disturbed

U: Undisturbed

LR: Low resiliency

MR: Moderate resiliency

HR: High resiliency

*ATTACHMENT IR2 - AMENDED TABLE 10.1:
PROJECT INTERACTIONS WITH VCS*

Amended Table 10.1: Project Interactions with VCs

Project Components and Physical Activities	Fish and Fish Habitat				Migratory Birds			Species at Risk (SAR)		Human Health	Other Socio-Economic Conditions		Archaeological and Cultural Heritage Resources	
	Change in Fish Habitat	Change in Fish Movement, Migration and Fish Passage	Change in Fish Mortality	Change in Water Quality	Change in Migratory Bird Mortality	Change in Migratory Bird Habitat	Sensory Disturbance of Migratory Birds	Changes in direct mortality to SAR	Change to critical habitat of SAR	Change in Human Health	Change in Demand for Community Services and Infrastructure	Change in the Quantity and Quality of Land and Resource Use	Unauthorized disturbance or destruction of part or all of an archaeological site or sites	Unauthorized loss of, or alteration to, the cultural heritage value or interest of a Cultural Heritage resource, or an element thereof
Construction														
Site Preparation and Grading Activities	–	–	–	✓	✓	✓	–	✓	✓	✓	–	✓	✓	✓
Track Construction and Signals Installation	–	–	–	–	–	✓	–	✓	–	–	–	✓	–	–
Terminal Infrastructure	✓	✓	✓	✓	–	–	–	–	–	–	–	✓	–	–
Grade Separations	–	–	–	–	–	✓	–	✓	–	–	✓	✓	✓	✓
Utilities	–	–	–	–	–	✓	–	✓	–	–	–	–	✓	✓
Watercourse Realignment, Restoration and Naturalization	✓	✓	✓	✓	✓	✓	–	✓	–	–	–	✓	✓	✓
Construction Equipment and Operation	–	–	✓	✓	✓	✓	–	✓	✓	–	–	✓	✓	✓

Amended Table 10.1: Project Interactions with VCs

Project Components and Physical Activities	Fish and Fish Habitat				Migratory Birds			Species at Risk (SAR)		Human Health	Other Socio-Economic Conditions		Archaeological and Cultural Heritage Resources	
	Change in Fish Habitat	Change in Fish Movement, Migration and Fish Passage	Change in Fish Mortality	Change in Water Quality	Change in Migratory Bird Mortality	Change in Migratory Bird Habitat	Sensory Disturbance of Migratory Birds	Changes in direct mortality to SAR	Change to critical habitat of SAR	Change in Human Health	Change in Demand for Community Services and Infrastructure	Change in the Quantity and Quality of Land and Resource Use	Unauthorized disturbance or destruction of part or all of an archaeological site or sites	Unauthorized loss of, or alteration to, the cultural heritage value or interest of a Cultural Heritage resource, or an element thereof
Air Contaminant Emissions	-	-	-	-	-	-	-	-	-	✓	-	✓	-	-
Acoustic Emissions	-	✓	-	-	-	✓	-	-	✓	-	-	✓	-	-
Solid Waste Management and Recycling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations														
Truck Entrance/Exit (Gate)	-	-	-	-	✓	✓	-	✓	-	-	-	-	-	-
Train Operations	-	✓	-	✓	✓	✓	-	✓	-	-	-	✓	-	-
Lift Operations	-	-	-	-	-	✓	-	-	-	-	-	✓	-	-
Equipment Maintenance	-	-	-	✓	-	✓	-	-	-	-	-	-	-	-
Water Management	-	-	-	✓	✓	-	-	-	✓	-	-	-	-	-

Amended Table 10.1: Project Interactions with VCs

Project Components and Physical Activities	Fish and Fish Habitat				Migratory Birds			Species at Risk (SAR)		Human Health	Other Socio-Economic Conditions		Archaeological and Cultural Heritage Resources	
	Change in Fish Habitat	Change in Fish Movement, Migration and Fish Passage	Change in Fish Mortality	Change in Water Quality	Change in Migratory Bird Mortality	Change in Migratory Bird Habitat	Sensory Disturbance of Migratory Birds	Changes in direct mortality to SAR	Change to critical habitat of SAR	Change in Human Health	Change in Demand for Community Services and Infrastructure	Change in the Quantity and Quality of Land and Resource Use	Unauthorized disturbance or destruction of part or all of an archaeological site or sites	Unauthorized loss of, or alteration to, the cultural heritage value or interest of a Cultural Heritage resource, or an element thereof
Site Buildings, Linear Facilities and Associated Infrastructure	-	-	-	✓	✓	-	✓	-	-	-	-	✓	-	-
Operation Labour Requirements	-	-	-	-	-	✓	-	-	✓	-	-	✓	-	-
Air Contaminant Emissions	-	-	-	-	-	-	-	-	-	✓	-	✓	-	-
Acoustic Emissions	-	✓	-	-	-	✓	-	-	✓	-	-	✓	-	-
Solid Waste Management and Recycling	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Amended Table 10.1: Project Interactions with VCs

Project Components and Physical Activities	Fish and Fish Habitat				Migratory Birds			Species at Risk (SAR)		Human Health	Other Socio-Economic Conditions		Archaeological and Cultural Heritage Resources	
	Change in Fish Habitat	Change in Fish Movement, Migration and Fish Passage	Change in Fish Mortality	Change in Water Quality	Change in Migratory Bird Mortality	Change in Migratory Bird Habitat	Sensory Disturbance of Migratory Birds	Changes in direct mortality to SAR	Change to critical habitat of SAR	Change in Human Health	Change in Demand for Community Services and Infrastructure	Change in the Quantity and Quality of Land and Resource Use	Unauthorized disturbance or destruction of part or all of an archaeological site or sites	Unauthorized loss of, or alteration to, the cultural heritage value or interest of a Cultural Heritage resource, or an element thereof
Accidents and Malfunctions														
Hazardous materials spill (including fuel, oil, glycol, lubricants and hydraulic fluid) or ignition of spilled fuel	✓				✓			✓		-	✓		-	
Intermodal container spill on land	✓				✓			✓		-	-		-	
Traffic accidents at the entry points to the Terminal	-				-			-		-	✓		-	
Derailment involving a release of fuel from a locomotive	-				-			-		✓	✓		-	

Amended Table 10.1: Project Interactions with VCs

Project Components and Physical Activities	Fish and Fish Habitat				Migratory Birds			Species at Risk (SAR)		Human Health	Other Socio-Economic Conditions		Archaeological and Cultural Heritage Resources	
	Change in Fish Habitat	Change in Fish Movement, Migration and Fish Passage	Change in Fish Mortality	Change in Water Quality	Change in Migratory Bird Mortality	Change in Migratory Bird Habitat	Sensory Disturbance of Migratory Birds	Changes in direct mortality to SAR	Change to critical habitat of SAR	Change in Human Health	Change in Demand for Community Services and Infrastructure	Change in the Quantity and Quality of Land and Resource Use	Unauthorized disturbance or destruction of part or all of an archaeological site or sites	Unauthorized loss of, or alteration to, the cultural heritage value or interest of a Cultural Heritage resource, or an element thereof

NOTES:





✓ = Potential interactions that might cause an effect.

- = Actions between the Project and the VC are not expected.

ATTACHMENT IR5 – CONCEPTUAL PROJECT SCHEDULE

EIS Ref.	Project Activities	Year 1				Year 2				Year 3			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
3.4.1.1	Site Preparation & Clearing												
6.5.2.2	<i>Migratory Bird Timing Window (clearing with mitigation)</i>												
3.4.1.1	Grading Activities												
	Area grading												
	Buildings												
	Access roads												
3.4.1.2	Track Construction and Signals Installation												
	Lower Base Line track diversion												
	Signals												
	Track grading												
	Track realignment/construction												
3.4.1.3	Terminal Infrastructure												
	Construction of SWM ponds												
	Installation of culvert & drainage structures												
	Construction of administration building & maintenance garage												
	Placement of granular material												
	Paving activities												
	Yard track												
3.4.1.4	Grade Separations												
	Underpass at Lower Base Line												
	Overpass across the CN track												
3.4.1.5	Utilities												
	Sanitary/wastewater												
	Electrical												
	Water												
	Fibre optics												
	Air												
3.4.1.6	Watercourse Realignment, Restoration and Naturalization												
	Creek realignment (construction of new off-line channels)												
	Channel diversion												
	Restoration and enhancement												
6.5.1.2	RAP (no in-water work)												
7.0	In-Water Work Timing Restrictions (Snapping Turtle)												

Legend:

-  Proposed Construction Activities (high level)
-  Proposed Construction Activities (specific activities)
-  Timing Restrictions
-  Rehabilitation/Restoration

ATTACHMENT IR6 – SITE SELECTION ALTERNATIVES ADDENDUM

INTRODUCTION

The purpose of this attachment is to provide further explanation of the alternatives evaluation from the EIS (Section 2.2, page 24 to 41, and Appendix F), with specific reference to Valued Components (VCs) and potential effects on VCs. Clarification is also provided to explain the technical criteria necessary for CN to select a feasible location for a satellite intermodal terminal and how this was used in the site selection process.

STEP 1 - TECHNICAL FEASIBILITY

The Site Selection Study (Appendix F, Section 3, page 5 to 7) outlines the site selection principles determined by CN for the identification of an appropriate location for a satellite intermodal terminal. These principles are indicated in Section 3.1 (Appendix F, page 5), and resulted in the identification of four (4) potential site locations (Appendix F, Table 3.1, page 7) with sufficient undeveloped lands (400 ha parallel to mainline) between the Bayview and Doncaster Junctions along the CN mainline, as follows:

- Brampton North – generally located between the Credit River and Mississauga Road, consisting of agricultural lands, several tributaries of the Credit River and associated wetlands and woodland features (Figure 5, Appendix F);
- Halton Hills – generally located between Trafalgar Road and Esquesing Line south of Georgetown, consisting of agricultural lands along the east side of the CN mainline adjacent to the Niagara Escarpment, a portion of Middle Sixteen Mile Creek, and wetland and woodland features (Figure 6, Appendix F);
- North Milton - generally located between James Snow Parkway North and 10th Sideroad north of Milton, consisting of agricultural lands, woodlands, tributaries of the Credit River and a golf course along the east side of the CN mainline (Figure 7, Appendix F); and
- South Milton - generally located between Britannia Road and 2nd Sideroad, consisting of agricultural lands, a portion of Indian Creek and associated tributaries, and wetland and woodland features west of the Halton Region Waste Management Site (Figure 8, Appendix F).

For the purposes of performing a broader comparative evaluation, the alternative assessment reflected in the EIS did not engage in a preliminary technical feasibility pre-screening. The principal criteria for a site selection is the mainline grade, based on the requirement for a level terminal working area. The site selected along the mainline must have an overall mainline grade of less than 0.3% in order to allow for the connecting tracks to be built with suitable railway grades. The Site Selection Study (Appendix F) includes sketches in Section 4.1.1 (page 11) comparing a terminal with the adjacent mainline having a shallow grade to one with the mainline having steeper grades.

Applying that step of the Operational Policy Statement (CEAA, 2015) results in screening out two of the four potential site locations, as North Milton and Halton Hills were identified as having mainline track grades too steep for the safe and efficient operation of trains (Appendix F, Section 4.1.1, page 11 to 12). As such, these two locations are not considered technically feasible alternatives (Appendix F, Section 4.3.1.2, page 17).

As such, based on the Operational Policy Statement (CEAA, 2015), the two sites that would be considered technically feasible alternatives (i.e., Step 1 of the alternative means assessment) would be the Brampton North and South Milton locations.

STEP 2 – ENVIRONMENTAL EVALUATION CRITERIA

The criteria used to compare the potential environmental effects of constructing and operating a terminal at each of the sites is described in the Site Selection Study (Appendix F, Section 4.1, page 11 to 15). The criteria developed for the comparative evaluation of the sites addresses key components of each of the VCs identified in Section 6.3 of the EIS Guidelines, as follows:

Table 1 Application of Site Selection Criteria to Valued Components

VCs per Section 6.3 of the EIS Guidelines	Section 4.1 of the Site Selection Study (Appendix F)
6.3.1 – Fish and Fish Habitat	Section 4.3.3.1 – Watercourses (habitat)
6.3.2 – Migratory Birds	Section 4.3.3.2 – Wetlands (potential habitat) Section 4.3.3.5 – Woodlands (potential habitat)
6.3.3 – Species at Risk	Section 4.3.6 and Table 4.4 – Species at Risk
6.3.4 – Aboriginal Peoples*	Section 4.3.4.4 – Archaeological Resource Potential
6.3.5 – Socio-Economic Criteria**	Section 4.3.4.1 – Existing Land Use Compatibility Section 4.3.4.2 – Planned Land Use Compatibility Section 4.3.4.3 – Heritage Resource Potential

*Note: VCs that would have potential effects on Aboriginal Peoples and traditional land uses were considered in the sections above. The same Aboriginal groups would be considered through consultation for the candidate sites.

**Note: Potential effects on human health are related to emissions from construction and operation of a terminal, which would be fundamentally similar, with similar background air quality and would be managed using the same mitigation at each location. As such, potential human health effects are considered to be equivalent at both sites.

POTENTIAL EFFECTS ON VALUED COMPONENTS

For the technically feasible terminal locations identified above, and based on the results presented in the Site Selection Study (Appendix F, Section 4.0, page 11 to 28), the following table (**Table 2**) outlines the comparison of the potential effects on identified VCs for each site.

Table 2 Alternative Site Location Comparison

Criteria	Brampton North	South Milton	Discussion	Mitigation
1. Fish and Fish Habitat			Preferred: South Milton	
a. Number of potential watercourse crossings	26	10	<ul style="list-style-type: none">Fewer number of potential watercourse crossings.Reduced potential stream length, leading to reduced potential interaction with fish and fish habitat.Reduced potential effects on aquatic SAR.	<ul style="list-style-type: none">Potential presence and location of watercourses would be subject to site investigation.Standard mitigation considered for either location, where necessary (e.g., timing windows for in-water work, erosion and sediment controls, etc.).Additional mitigation presumed necessary to avoid and protect Redside Dace habitat at Brampton North (see below).A site with fewer potentially effected features is lower risk from an environmental perspective than a site with more of the features, as potential interactions between the Project and these features are reduced.
b. Total stream length	19.7 km	15.1 km		
2. Migratory Birds			Preferred: South Milton	
a. Number of wetlands	2	2	<ul style="list-style-type: none">Similar potential for disturbance to wetland habitats, which are potentially frequented by migratory birds during various life cycles.Reduced potential for disturbance to woodland habitats through direct or indirect effects, including potential removal of woodland vegetation.	<ul style="list-style-type: none">Potential migratory bird use of the wetlands and woodlots would be subject to site investigation.Standard mitigation considered for either location, where necessary (e.g., construction during daylight hours, retaining vegetation wherever practicable, etc.).A site with a smaller area of potentially effected features is lower risk from an environmental perspective than a site with a greater area of the features, as potential interactions
b. Wetland Area	5.1 ha	4.5 ha		
c. Woodlot Area	134 ha directly or indirectly effected	50 ha directly or indirectly effected		

Criteria	Brampton North	South Milton	Discussion	Mitigation
				between the Project and these features are reduced.
3. Species at Risk			Preferred: South Milton	
a. Number of SAR potentially impacted	4	5	<ul style="list-style-type: none"> Despite greater number of potential SAR known to occur in the vicinity of the site, some species identified in background are not suited to habitats within site location. Redside Dace (<i>Clinostomus elongates</i>) are potentially present in tributaries at Brampton North, which are sensitive to the loss of riparian channel vegetation and sedimentation; not present at South Milton. Shortnose Cisco (<i>Coregonus reghardi</i>) was identified in background review, but on-site watercourses are not considered suitable habitat. Bobolink (<i>Dolichonyx oryzivorus</i>) and Eastern Meadowlark (<i>Sturnella magna</i>) are likely present at both sites (agricultural fields), as are Butternut (<i>Juglans cinerea</i>) trees Eastern Flowering Dogwood (<i>Cornus florida</i>) are known in the vicinity of South Milton. 	<ul style="list-style-type: none"> Potential presence and location of species would be subject to site investigation. Standard mitigation considered for either location, where necessary (e.g., speed limits on internal roads, avoid unnecessary vegetation clearing, etc.). Additional mitigation presumed necessary to avoid and protect Redside Dace habitat (Brampton North).
4. Socio-Economic Conditions			Preferred: South Milton	
a. Existing land use compatibility	Low	High	<ul style="list-style-type: none"> South Milton considered high compatibility with existing land use, as majority of the site is agricultural, separated from existing built up residential and in proximity 	<ul style="list-style-type: none"> Standard mitigation considered for either location, where necessary (e.g., consultation with municipalities and public).

Criteria	Brampton North	South Milton	Discussion	Mitigation
b. Planned land use compatibility	Low	Moderate	<p>to other compatible land uses (i.e., Halton Region Waste Management Site, Burlington Airpark).</p> <ul style="list-style-type: none"> South Milton considered greater compatibility with planned land uses, as lands to the west of existing mainline are designated for future employment within the Urban Boundary, adjacent lands east of the existing mainline are designated as future strategic employment areas, potential to maintain separation from planned residential uses (north of Britannia Road), and the Region is aware of planned rail-based development on this site and acknowledges CN's long-range plan for an intermodal facility (as per Halton Region TMP 2011-2013). 	<ul style="list-style-type: none"> Additional mitigation presumed necessary for Brampton North to avoid the area of the site encroaching on existing residential development and the school and church within the site. Additional mitigation and potential effect on planned land use presumed necessary for Brampton North as the planned land use is an urban development area for a compact, complete and connected community, including residential uses, limiting land available for a Terminal.
c. Potential for cultural heritage resource concerns	Low	High	<ul style="list-style-type: none"> Greater potential effects on cultural heritage resources – includes 1 property designated under Part IV of the <i>Ontario Heritage Act</i> and 23 properties listed on the Town of Milton's Heritage List. 	<ul style="list-style-type: none"> Potential presence and location of heritage resources would be subject to further study. Standard mitigation considered for either location, where necessary. Additional mitigation may be required for South Milton to avoid or protect a greater number of heritage properties.
5. Aboriginal Peoples			Preferred: No Preference	
a. Potential for archaeology concerns	High	High	<ul style="list-style-type: none"> High potential for archaeology concerns due to presence of watercourse (no differentiation between sites). 	<ul style="list-style-type: none"> A Stage 1 and 2 Archaeological Assessment would be completed for each site to determine archaeological potential.
b. Identified Aboriginal communities	4	4	<ul style="list-style-type: none"> The same Aboriginal communities would have been identified for consultation (no differentiation between sites). 	<ul style="list-style-type: none"> Standard mitigation measures for archaeological finds would be expected for both sites, no differentiation. Consultation and engagement of

Criteria	Brampton North	South Milton	Discussion	Mitigation
				Aboriginal communities would be required for each site throughout the life of the project.

PREFERRED SITE DETERMINATION

For each of the two sites, it was assumed that careful design implementation based on completion of a full EIS, along with standard mitigation measures (e.g., timing windows, erosion and sediment controls, stormwater management), would be implemented to reduce potential risks. Of course, the contemplation that those risks will be reduced does not eliminate them, so they were still considered an important element of the comparative analysis.

Of the two sites, the South Milton site has less potential for environmental interactions and therefore reduced potential for adverse effects on the VCs, with two exceptions. The South Milton site has a greater potential effect on cultural heritage resources, based on the number of identified heritage resources, although through further study and implementation of mitigation measures, potential effects can be reduced. Also, in terms of potential SAR known to exist within the vicinity of each site, background data suggests that South Milton has one more potential SAR than Brampton North, although habitat for that SAR (Shorthose Cisco) is not present within this site, so as a practical matter the risk is low.

The Brampton site has higher potential for adverse effects on all the other VCs, including:

- Greater number of potential watercourse crossings/interactions;
- Longer stream length leading to greater potential interaction with fish and fish habitat;
- Greater potential effect on provincial fish SAR due to the presence of habitat for Redside Dace;
- Slightly greater potential for disturbance to wetland habitats potentially frequented by migratory birds during various life cycles;
- Greater potential for disturbance to woodland habitats either through direct or indirect effects, including potential removal of woodland vegetation;
- Considered low compatibility with existing land use. While the majority of the site is agricultural, the site is located adjacent to an existing residential development located east of Mississauga Road, with an existing school located within the site west side of Winston Churchill Boulevard (Norval Outdoor School) and a church located within the site east of Heritage Road (St. Elias Ukrainian Catholic Church); and,
- Considered low compatibility with future planned land uses, where the City of Brampton Official Plan has designated these lands as part of the North West Brampton Urban Development Area, which is planned as a mixed-use development that includes a range of housing types and densities and employment lands (City of Brampton 2013). This limits the land available for the proposed intermodal terminal, as well as the potential for buffering, as the entire Brampton North site is planned for such purposes.

Potential effects to Aboriginal peoples is expected to be similar for each site as they both have high potential for archaeological concerns and the same Aboriginal communities would be consulted for each site.

Prepared on May 18, 2016

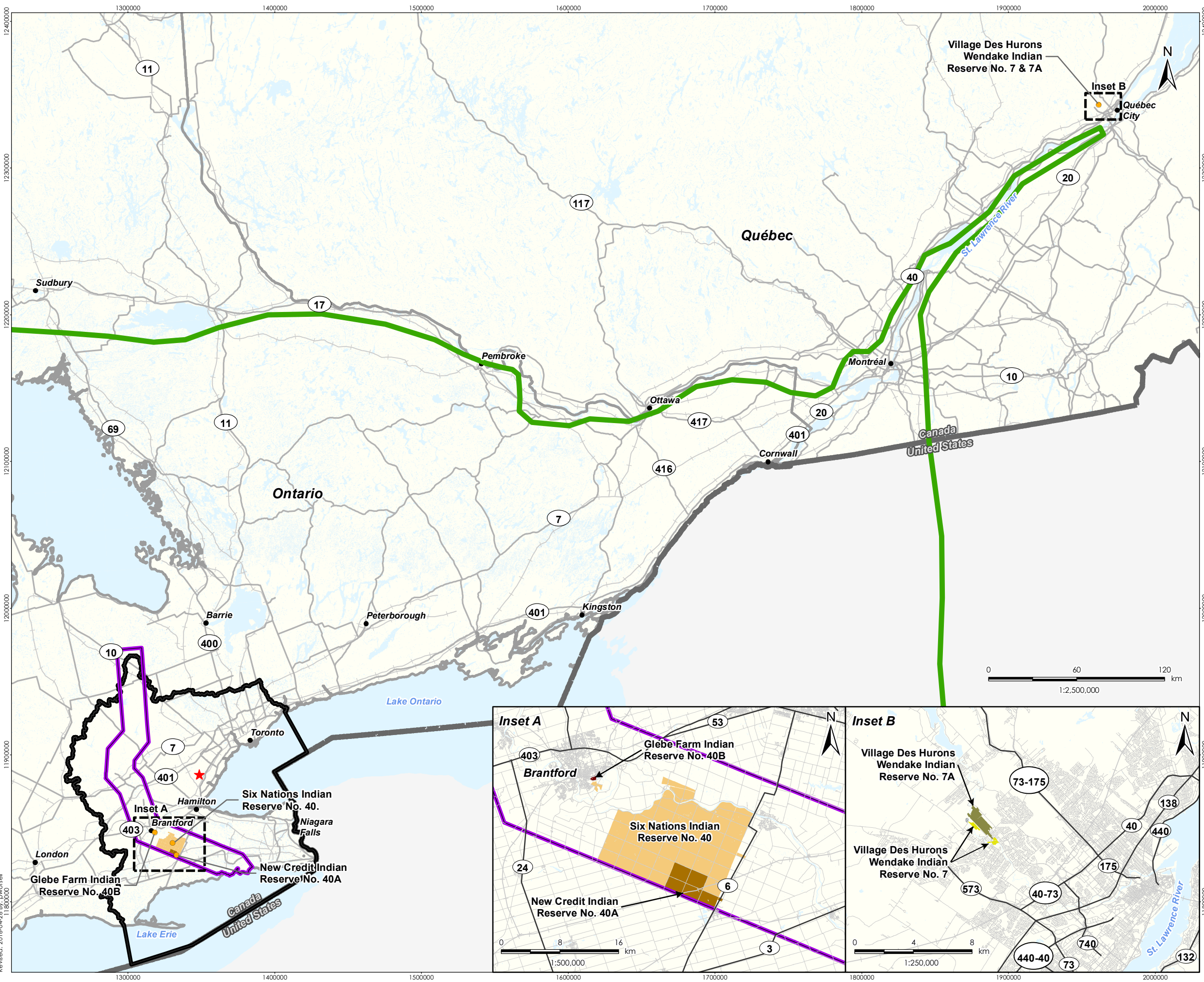
Giving each of the criterion equal weighting, it is evident that the South Milton site carries less risk for the VCs in the aggregate, thereby reducing potential environmental interactions and potential for adverse effects, and is therefore the preferred alternative site.

REFERENCES

- Canadian Environmental Assessment Agency (CEAA). 2015. Operational Policy Statement: Addressing "Purpose of" and "Alternative Means" Under the Canadian Environmental Assessment Act, 2012.
- City of Brampton. 2013. 2006 Official Plan. November 2013 Consolidation of the City of Brampton 2006 Official Plan. Accessed on July 7, 2015. Available online at: <http://www.brampton.ca/en/Business/planning-development/policies-masterplans/Pages/Official-Plan.aspx>.
- Halton Region (2011). The Road to Change: Halton Region Transportation Master Plan 2031. Available online at: <http://www.halton.ca/common/pages/UserFile.aspx?fileId=68566>. Produced for Halton Region by Dillon Consulting Limited in Association with GHD Inc. and Aecom. Accessed July 6, 2015.

ATTACHMENT IR8 – TRADITIONAL TERRITORIES SUPPLEMENTAL INFORMATION

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Revised: 2016-04-26 By: p.worsell



- Legend**
- ★ Project Location
 - Aboriginal Reserve - General Location
 - Glebe Farm Indian Reserve No. 40B
 - New Credit Indian Reserve No. 40A
 - Six Nations Indian Reserve No. 40
 - Village Des Hurons Wendake Indian Reserve No. 7
 - Village Des Hurons Wendake Indian Reserve No. 7A
 - Major City
 - Highway/Major Road
 - Railway
 - Waterbody
 - Provincial Boundary
 - International Boundary
 - MNCFM Traditional**
 - Mississaugas of the New Credit Traditional Territory
 - Six Nations Traditional**
 - 1784 Haldimand Treaty Area (Six Nations)*
 - 1701 Fort Albany (Nanfan) Treaty and Traditional Lands*

- Notes**
1. Coordinate System: NAD 1983 Lambert Conformal Conic
 2. Base features produced under license with © ESRI Canada, 2015; © GeoBase, 2015.
 3. Mississaugas of the New Credit First Nation boundary © MNCFM 2016.
 4. Six Nations Treaty Area boundary obtained from sixnations.ca
 5. *Interpretation of Six Nations traditional territory as taken from the document "Land Rights A Global Solution for the Six Nations of the Grand River (2015)".
- April 2016
160960844

Client/Project
Canadian National Railway Company
Milton Logistics Hub
Environmental Impact Statement

Figure No.
IR#8

Title
Aboriginal Reserves and Traditional Territories

SIX NATIONS LAND RIGHTS SUMMARY

"Perpetual Care and Maintenance" • February 2015

THE BIG PICTURE

In 1983, the Six Nations Elected Council appeared before the Parliamentary Task Force on Indian Self-Government. We then stated self-determination, Indian Government, and special relationships are empty words unless there are the resources to make them real. The resources of which we speak are those to which we are legally entitled. Revenue sharing and resolving our land rights issues are major components for us to perpetually resource our government.

In 1996, a Royal Commission on Aboriginal Peoples reported to the Federal Government and proposed solutions for a new and better relationship between Aboriginal peoples and the Canadian Government including the recognition of the right to Self-Government. The Royal Commission recognized the inherent right to Self-Government as an "existing" Aboriginal and treaty right as recognized and affirmed by *Section 35(1) of Canada's Constitution Act, 1982*.

The Federal Government has since recognized the right of self-government as an existing inherent Aboriginal and treaty right within *35(1) of Canada's Constitution Act, 1982*.

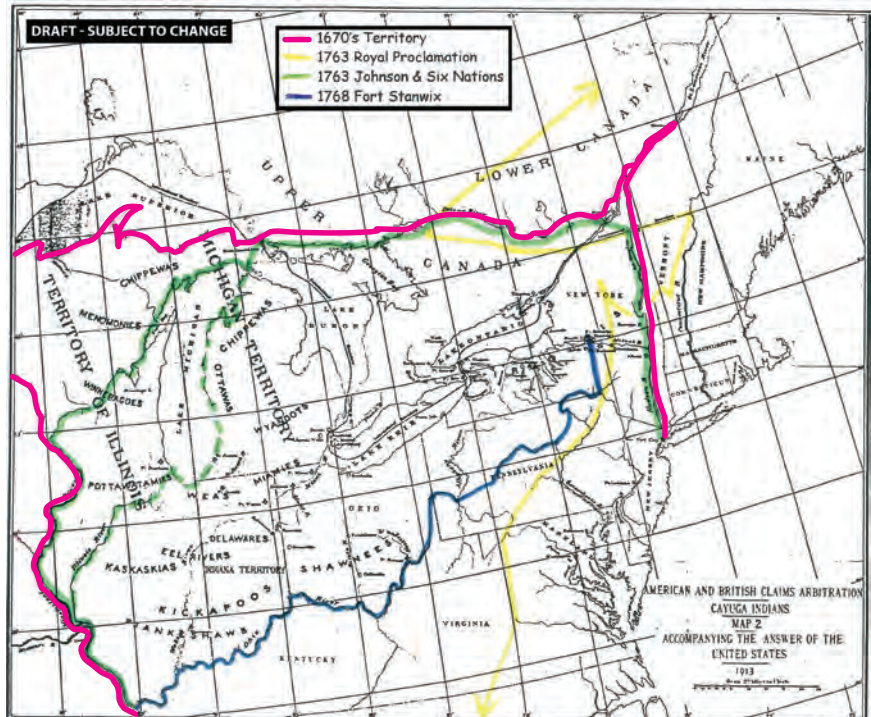
THE 1701 FORT ALBANY (NANFAN) TREATY AND TRADITIONAL LANDS

In 1701, the Imperial Crown entered into treaty with Five Nations (later became the Six Nations) in which the Crown undertook to protect from disturbance or interference a large portion of lands the Six Nations had obtained from the Huron by conquest. This Treaty would ensure Six Nations' right to exercise freely the right to pursue their economic livelihood utilizing the natural resources contained in the said Treaty Lands throughout central and southwestern Ontario.

These rights to unmolested trade and commerce throughout the region was again affirmed the Five Nations in the Treaty of Utrecht.

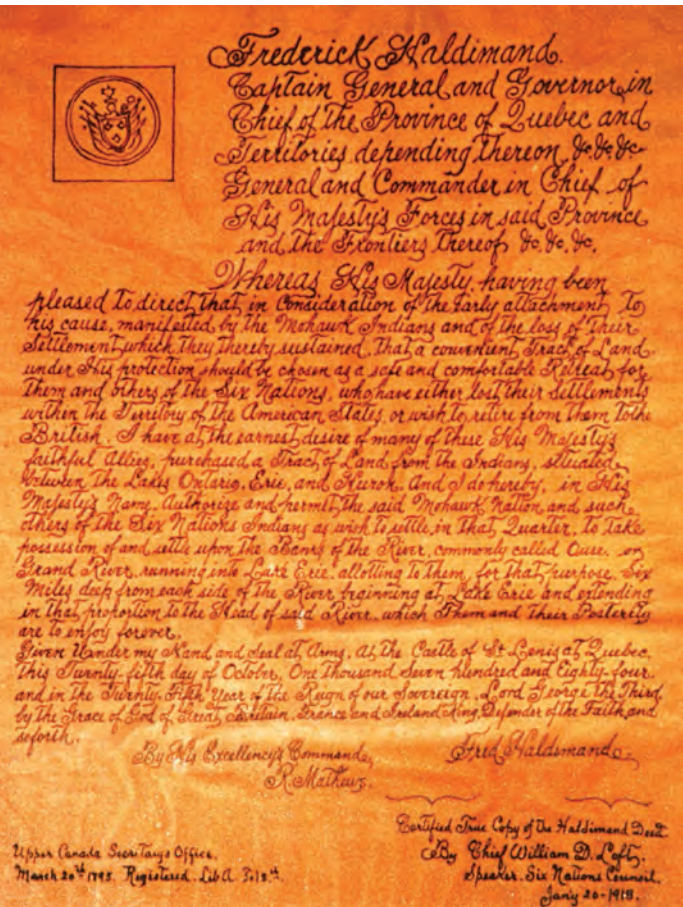
Our Treaty Rights as affirmed by the 1701 Fort Albany Treaty are protected under *Section 35(1) of Canada's Constitution Act, 1982* and as such are

subject to the Crowns' (Canada and Ontario) duty to consult and accommodate our broad range of interests. In addition to our undisturbed right to hunting and fishing, that consultation and accommodation includes Six Nations participation in environmental monitoring and revenue sharing by others intending to develop on and exploit any resources from within our 1701 Fort Albany Treaty lands.



Six Nations interpretation of their Traditional Territory of North America

THE SIX NATIONS 1784 HALDIMAND TREATY

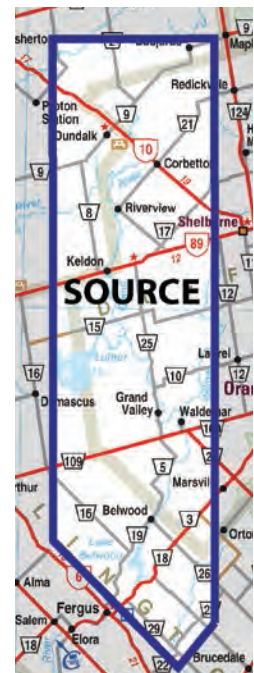


(l) Lands granted by Haldimand Treaty and (r) Copy of Haldimand Treaty of October 25, 1784

The Haldimand Treaty of October 25, 1784, promised a tract consisting of approximately 950,000 acres within their Beaver Hunting Grounds along the Grand River to the “Mohawk Nation and such others of the Six Nations Indians as wish to settle in that Quarter” in appreciation of their allegiance to the King and for the loss of their settlements in the American States. They were “to take possession of and settle upon the Banks of the River, commonly called Ouse or Grand River, running into Lake Erie, allotting to them for that purpose Six Miles deep from each side of the River beginning at Lake Erie and extending in that proportion to the Head of said River, which They and Their Posterity are to enjoy forever”.

From 1784 to the present date, 275,000 acres of lands up to the source of the Grand River remains an outstanding treaty land entitlement to the Six Nations people. In addition, compensation for the 230-year loss of use and enjoyment of these lands require redress.

The 1784 Haldimand Treaty unequivocally promised that a tract of land six miles deep on each side of the Grand River from the rivers mouth to its source was to be laid out for Six Nations and their posterity to enjoy forever. However, the Six Nations Tract as laid out is only 960 chains (12 miles) in total width with the area of the Grand River meandering between its outer limits. The area equal to the area of the Grand River remains an outstanding treaty land entitlement to the Six Nations people.



**275,000 acres
outstanding
treaty entitlement**

ATTACHMENT IR12 – AIR QUALITY ANALYSIS FOR PARTICIPATING RECEPTORS

To determine the potential effects on participating receptors (i.e., a property that is associated with the Project, located on land owned by CN that has not been considered as a Point of Reception (POR) in the effects assessment), interpolation of existing air quality modelling results used in the preparation of the Air Quality TDR (Appendix E.1) was completed for the participating receptors. The results were compared to the applicable criteria and a supplemental health analysis is also provided.

PARTICIPATING RECEPTORS

A “Participating Receptor” is defined in the EIS as “a property that is associated with the Project, located on land owned by CN that has not been considered as a Point of Reception (POR) in the effects assessment” (Appendix E.1, Glossary, page xi). The location of each participating receptor (and corresponding receptor identifier) is noted on **Figure IR#12** (see **Attachment A**). The distance of these receptors to the PDA is provided in **Table 1**.

Table 1 – Description and Distance of Participating Receptors to the PDA

Receptor ID	Location	Distance to PDA*
B1	5694 Hwy 25	1,425 m
E6	5324 First Line Rd.	652 m
E9	5258 First Line Rd.	640 m
E16	5062 First Line Rd.	639 m
E19	3242 Lower Base Line W	27 m
E20	3214 Lower Base Line W	22 m
W5	5381 Tremaine Rd.	Within the PDA
W9	5237 Tremaine Rd.	27 m
W10	5193 Tremaine Rd.	45 m
W11	5269 Tremaine Rd.	Within the PDA
W12	5133 Tremaine Rd.	Within the PDA
W13	5127 Tremaine Rd.	Within the PDA
W17	3249 Lower Base Line Rd.	Within the PDA
W18	4512 Tremaine Rd.	61 m
W19	4519 Tremaine Rd.	80 m

*Note: Distance in metres measured from the closest point of each dwelling to the closest point of the PDA.

SUPPLEMENTAL AIR QUALITY ANALYSIS

The objective of the air quality analysis is to provide predictions of airborne contaminants at “participating receptors” using interpolation of existing air dispersion modeling completed for the Air Quality TDR (Appendix E.1). The maximum predicted concentrations for each contaminant of concern at each residence are summarized in Tables B1 to B12 as **Attachment B**.

Background concentrations are used in dispersion modeling to represent the combined effect of other emission sources (both anthropogenic and biogenic) in addition to the sources being included in the dispersion modelling. As with the AQ TDR (Appendix E.1), background concentrations for the Project were conservatively determined by taking the 90th percentile concentration of each contaminant of concern from the historical long-term ambient air

Prepared on May 18, 2016

concentrations measured at nearby National Air Pollution Surveillance Program (NAPS) stations. A summary of the background concentrations used for the supplemental air emission assessment is provided in Table C1 as **Attachment C**.

In accordance with the EIS Guidelines, the airborne concentrations of the following chemicals of potential concern (COPCs) were estimated:

- Nitrogen oxides (NO_x);
- Carbon monoxide (CO);
- Sulphur dioxide (SO₂);
- Particulate matter (PM);
- Particulate matter (PM₁₀);
- Fine particulate matter (PM_{2.5});
- Benzene;
- 1,3-Butadiene;
- Acrolein;
- Acetaldehyde;
- Formaldehyde; and,
- Benzo(a)pyrene (B(a)P), as a surrogate for total Polycyclic Aromatic Hydrocarbons (PAHs).

The results of the air quality analysis are presented in Tables B1 to B12 (**Attachment B**). Based on these results, as with non-participating receptors, there are no predicted exceedances except for B(a)P, for which the background level is already in excess of the applicable criteria (Appendix E1, Section 7.4.1.10, pages 79 to 80). All other COPCs assessed are predicted to be below applicable criteria.

SUPPLEMENTAL HEALTH ANALYSIS

A supplemental health analysis was carried out to evaluate the potential health risks to “participating receptors” from short-term and long-term direct exposures via inhalation of COPCs released during the operation phase of the Project.

The maximum predicted concentrations of the COPCs at each of the “participating receptor” locations determined by the supplemental air quality assessment were used in the health analysis. The results of the supplemental health analysis indicated that potential health risks are not expected from inhalation of COPCs from the Project at “participating receptor” locations. A summary of the risk characterization completed, based on the estimated maximum air concentrations at the “participating receptor” locations, for the supplemental health analysis is provided in Table D1 to D3 as **Attachment D**.

For all but one of the COPCs, predicted concentrations do not result in exposure ratios above the target benchmark at the “participating receptor” locations. As such, potential short-term and/or long-term health risks due to inhalation of these COPCs are not anticipated.

As discussed in the supplemental air quality analysis, the only predicted exceedance is for B(a)P. However, it is also noted that B(a)P background concentrations in the area already exceed applicable air quality standards. The predicted B(a)P levels are similar or below those in other urbanized areas of Ontario. As discussed in the HHRA TDR (Appendix E.7, Section 2.3, pages 6 to 8) in rural and urban areas, anthropogenic sources such as vehicular traffic and incomplete combustion of organic material and fossil fuels produce the majority of the PAHs (including B(a)P) found in the air. The results of the supplemental health analysis indicates that potential

Attachment IR12 – Air Quality Analysis for Participating Receptors

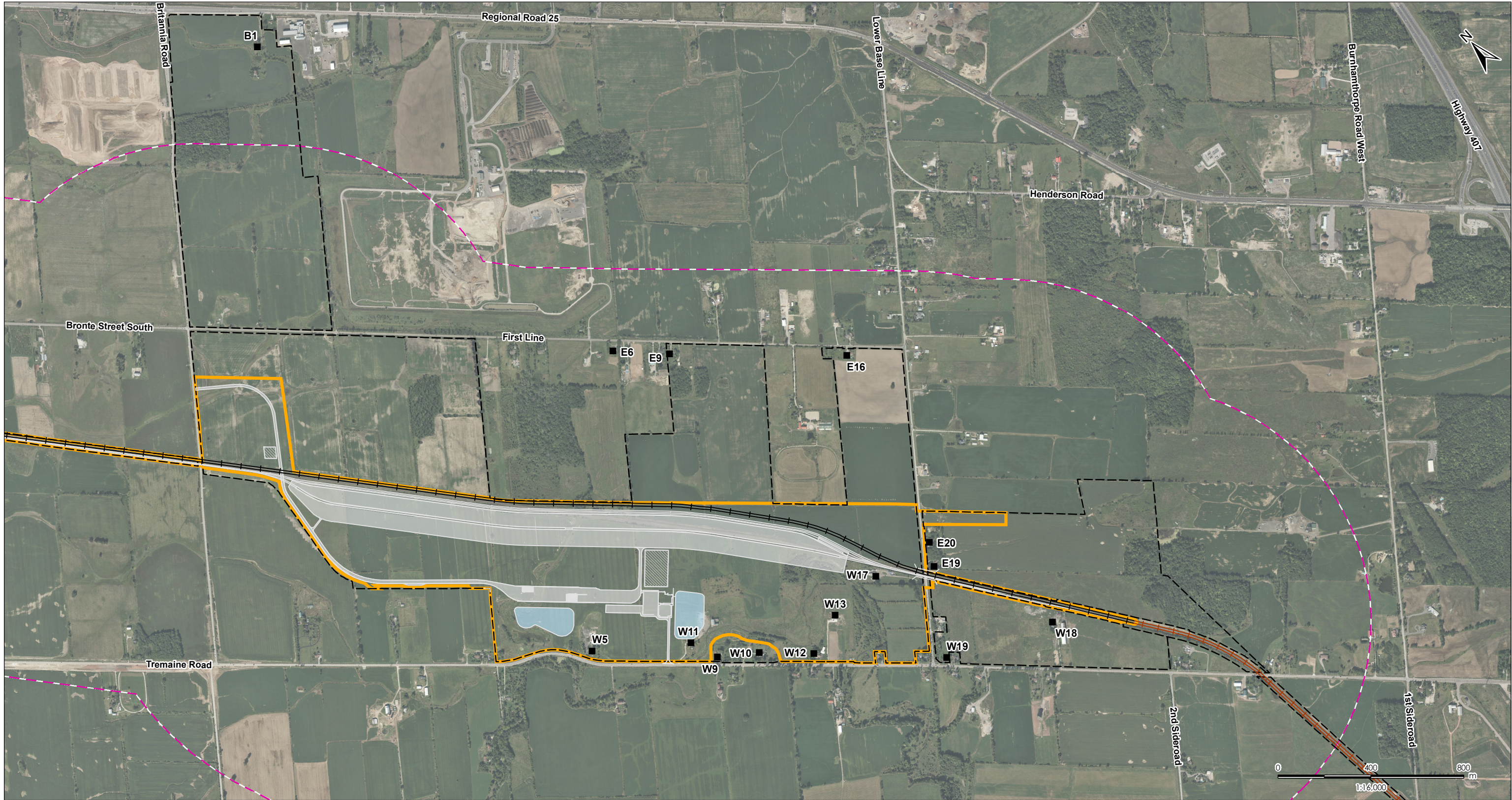
Prepared on May 18, 2016

health risks are not expected from inhalation of COPCs, including B(a)P, at “participating receptor” locations.

Overall, consistent with the conclusions of the EIS, a change in human health to “participating receptors” is not expected and will not likely result in a change to human health (EIS Section 6.5.4.9.3, page 230).

Attachment A

\\Cd1220-f02\01609\active\60960844\drawing\MXD\Atmospheric\Acoustic\CEAA_Response\160960844_CEA_FigIR12_CN_Participating_Receptors.mxd
Revised: 2016-05-17 By: p.worsell



May 2016
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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, 2016. Site layout: July 10, 2015.
3. Orthoimagery © First Base Solutions, 2016. Imagery taken in 2014.

Legend

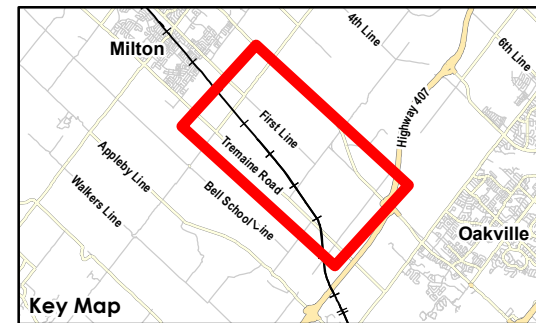
Project Components

- Project Development Area
- Local Assessment Area
- Existing Double Track Mainline
- Double Track - Mainline
- Project Component
- CN-Owned Property

- SWM Pond

Receptor Locations

- Participating Receptor



Client/Project
Canadian National Railway
Milton Logistics Hub

Figure No.
IR# 12

Title
CN Participating Receptors

Attachment B

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B1 - Summary of Participating Receptor Interpolation Results - Nitrogen Oxides
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)			Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)			Limiting Effect	Regulation	% of Criteria		
	UTM E (m)	UTM N (m)	1-Hour	24-Hour	Annual	1-Hour	24-Hour	Annual			1-Hour	24-Hour	Annual
B1	594423	4815127	31.4	11.3	2.3	400	200	100	Health	NAAQO	8%	6%	2%
E16	595397	4812436	61.3	30.4	6.8						15%	15%	7%
E19	595059	4811513	67.9	44.2	13.3						17%	22%	13%
E20	595114	4811602	66.4	37.3	9.3						17%	19%	9%
E6	594668	4813130	61.6	38.7	10.3						15%	19%	10%
E9	594838	4812956	65.2	36.4	10.0						16%	18%	10%
W10	594254	4811747	65.2	46.2	11.9						16%	23%	12%
W11	594067	4811977	75.6	53.9	16.5						19%	27%	16%
W12	594424	4811586	62.2	43.6	10.1						16%	22%	10%
W13	594604	4811645	65.2	45.7	11.0						16%	23%	11%
W17	594846	4811651	68.9	45.2	11.9						17%	23%	12%
W18	595273	4810992	60.9	35.0	8.1						15%	17%	8%
W19	594835	4811188	60.5	31.8	6.4						15%	16%	6%
W5	593729	4812239	71.3	51.4	16.4						18%	26%	16%
W9	594108	4811855	68.3	48.2	13.2						17%	24%	13%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B2 - Summary of Participating Receptor Interpolation Results - Carbon Monoxide
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	1-Hour	8-Hour	1-Hour	8-Hour			1-Hour	24-Hour
B1	594423	4815127	26.4	15.4	35000	15000	Health	NAAQO	0.1%	0.1%
E16	595397	4812436	65.0	54.3					0.2%	0.4%
E19	595059	4811513	113.7	62.0					0.3%	0.4%
E20	595114	4811602	113.5	54.2					0.3%	0.4%
E6	594668	4813130	75.3	67.7					0.2%	0.5%
E9	594838	4812956	100.2	67.1					0.3%	0.4%
W10	594254	4811747	106.4	93.3					0.3%	0.6%
W11	594067	4811977	197.3	152.5					0.6%	1.0%
W12	594424	4811586	83.5	77.9					0.2%	0.5%
W13	594604	4811645	109.6	93.0					0.3%	0.6%
W17	594846	4811651	140.2	86.9					0.4%	0.6%
W18	595273	4810992	65.6	38.2					0.2%	0.3%
W19	594835	4811188	71.3	54.6					0.2%	0.4%
W5	593729	4812239	153.6	113.2					0.4%	0.8%
W9	594108	4811855	134.0	106.1					0.4%	0.7%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B3 - Summary of Participating Receptor Interpolation Results - Sulphur Dioxide
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)			Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)			Limiting Effect	Regulation	% of Criteria		
	UTM E (m)	UTM N (m)	1-Hour	24-Hour	Annual	1-Hour	24-Hour	Annual			1-Hour	24-Hour	Annual
B1	594423	4815127	0.06	0.02	0.004	900	300	60	Health/ Vegetation	NAAQO	0.01%	0.01%	0.01%
E16	595397	4812436	0.16	0.07	0.014						0.02%	0.02%	0.02%
E19	595059	4811513	0.29	0.11	0.027						0.03%	0.04%	0.04%
E20	595114	4811602	0.27	0.08	0.018						0.03%	0.03%	0.03%
E6	594668	4813130	0.19	0.08	0.022						0.02%	0.03%	0.04%
E9	594838	4812956	0.23	0.09	0.022						0.03%	0.03%	0.04%
W10	594254	4811747	0.26	0.15	0.029						0.03%	0.05%	0.05%
W11	594067	4811977	0.50	0.25	0.051						0.06%	0.08%	0.09%
W12	594424	4811586	0.20	0.12	0.022						0.02%	0.04%	0.04%
W13	594604	4811645	0.26	0.14	0.026						0.03%	0.05%	0.04%
W17	594846	4811651	0.33	0.13	0.027						0.04%	0.04%	0.04%
W18	595273	4810992	0.17	0.07	0.014						0.02%	0.02%	0.02%
W19	594835	4811188	0.17	0.07	0.013						0.02%	0.02%	0.02%
W5	593729	4812239	0.39	0.18	0.044						0.04%	0.06%	0.07%
W9	594108	4811855	0.33	0.17	0.035						0.04%	0.06%	0.06%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B4 - Summary of Participating Receptor Interpolation Results - PM
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	24-Hour	Annual	24-Hour	Annual			24-Hour	Annual
B1	594423	4815127	2.0	0.49	120	70	Visibility	NAAQO	1.7%	0.7%
E16	595397	4812436	5.1	1.01					4.3%	1.4%
E19	595059	4811513	5.2	1.13					4.3%	1.6%
E20	595114	4811602	4.6	1.04					3.9%	1.5%
E6	594668	4813130	6.6	1.77					5.5%	2.5%
E9	594838	4812956	6.7	1.66					5.6%	2.4%
W10	594254	4811747	11.8	2.24					9.8%	3.2%
W11	594067	4811977	19.9	3.87					16.6%	5.5%
W12	594424	4811586	9.0	1.64					7.5%	2.3%
W13	594604	4811645	8.8	1.73					7.4%	2.5%
W17	594846	4811651	7.2	1.49					6.0%	2.1%
W18	595273	4810992	3.3	0.65					2.8%	0.9%
W19	594835	4811188	4.6	0.86					3.9%	1.2%
W5	593729	4812239	21.6	5.28					18.0%	7.5%
W9	594108	4811855	14.8	2.77					12.3%	4.0%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B5 - Summary of Participating Receptor Interpolation Results - PM10
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration (µg/m³)	Air Quality Objectives /Criteria* (µg/m³)	Limiting Effect	Regulation	% of Criteria
	UTM E (m)	UTM N (m)	24-Hour	24-Hour			24-Hour
B1	594423	4815127	0.9	50	Health	AAQC	2%
E16	595397	4812436	2.8				6%
E19	595059	4811513	3.1				6%
E20	595114	4811602	2.6				5%
E6	594668	4813130	3.4				7%
E9	594838	4812956	3.5				7%
W10	594254	4811747	6.0				12%
W11	594067	4811977	10.1				20%
W12	594424	4811586	4.7				9%
W13	594604	4811645	5.0				10%
W17	594846	4811651	4.1				8%
W18	595273	4810992	1.9				4%
W19	594835	4811188	2.6				5%
W5	593729	4812239	9.5				19%
W9	594108	4811855	7.3				15%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B6 - Summary of Participating Receptor Interpolation Results - PM2.5
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration (µg/m³)		Air Quality Objectives /Criteria* (µg/m³)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	24-Hour	Annual	24-Hour	Annual			24-Hour	Annual
B1	594423	4815127	0.7	0.14	27	8.8	Health	CAAQS	2.5%	1.6%
E16	595397	4812436	2.1	0.40					7.9%	4.6%
E19	595059	4811513	2.4	0.55					9.0%	6.2%
E20	595114	4811602	2.0	0.45					7.6%	5.1%
E6	594668	4813130	2.5	0.66					9.2%	7.5%
E9	594838	4812956	2.5	0.64					9.4%	7.3%
W10	594254	4811747	4.4	0.86					16.2%	9.8%
W11	594067	4811977	7.3	1.46					27.0%	16.6%
W12	594424	4811586	3.5	0.65					13.0%	7.3%
W13	594604	4811645	3.9	0.72					14.4%	8.2%
W17	594846	4811651	3.2	0.67					12.0%	7.6%
W18	595273	4810992	1.4	0.30					5.4%	3.4%
W19	594835	4811188	2.0	0.34					7.2%	3.9%
W5	593729	4812239	6.3	1.58					23.4%	18.0%
W9	594108	4811855	5.2	1.03					19.3%	11.7%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B7 - Summary of Participating Receptor Interpolation Results - Benzene
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	24-Hour	Annual	24-Hour	Annual			24-Hour	Annual
B1	594423	4815127	0.010	0.002	2.3	0.45	Health	AAQC	0.4%	0.4%
E16	595397	4812436	0.033	0.006					1.4%	1.4%
E19	595059	4811513	0.041	0.010					1.8%	2.1%
E20	595114	4811602	0.033	0.007					1.4%	1.6%
E6	594668	4813130	0.037	0.010					1.6%	2.2%
E9	594838	4812956	0.038	0.010					1.6%	2.1%
W10	594254	4811747	0.066	0.013					2.9%	2.9%
W11	594067	4811977	0.114	0.023					5.0%	5.1%
W12	594424	4811586	0.053	0.010					2.3%	2.2%
W13	594604	4811645	0.059	0.011					2.6%	2.4%
W17	594846	4811651	0.051	0.011					2.2%	2.4%
W18	595273	4810992	0.024	0.005					1.1%	1.1%
W19	594835	4811188	0.030	0.005					1.3%	1.2%
W5	593729	4812239	0.088	0.022					3.8%	4.9%
W9	594108	4811855	0.079	0.016					3.4%	3.5%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B8 - Summary of Participating Receptor Interpolation Results - 1,3-Butadiene
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	24-Hour	Annual	24-Hour	Annual			24-Hour	Annual
B1	594423	4815127	0.003	0.0005	10	2	Health	AAQC	0.03%	0.03%
E16	595397	4812436	0.008	0.0016					0.1%	0.1%
E19	595059	4811513	0.019	0.0051					0.2%	0.3%
E20	595114	4811602	0.011	0.0027					0.1%	0.1%
E6	594668	4813130	0.009	0.0023					0.1%	0.1%
E9	594838	4812956	0.010	0.0024					0.1%	0.1%
W10	594254	4811747	0.014	0.0028					0.1%	0.1%
W11	594067	4811977	0.018	0.0041					0.2%	0.2%
W12	594424	4811586	0.012	0.0023					0.1%	0.1%
W13	594604	4811645	0.014	0.0027					0.1%	0.1%
W17	594846	4811651	0.016	0.0037					0.2%	0.2%
W18	595273	4810992	0.012	0.0027					0.1%	0.1%
W19	594835	4811188	0.008	0.0016					0.1%	0.1%
W5	593729	4812239	0.020	0.0049					0.2%	0.2%
W9	594108	4811855	0.015	0.0032					0.1%	0.2%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B9 - Summary of Participating Receptor Interpolation Results - Acrolein
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	1-Hour	24-Hour	1-Hour	24-Hour			1-Hour	24-Hour
B1	594423	4815127	0.02	0.006	4.5	0.4	Health	AAQC	0.4%	2%
E16	595397	4812436	0.06	0.020					1%	5%
E19	595059	4811513	0.08	0.030					2%	7%
E20	595114	4811602	0.07	0.022					2%	5%
E6	594668	4813130	0.05	0.022					1%	6%
E9	594838	4812956	0.09	0.024					2%	6%
W10	594254	4811747	0.06	0.035					1%	9%
W11	594067	4811977	0.08	0.048					2%	12%
W12	594424	4811586	0.05	0.031					1%	8%
W13	594604	4811645	0.07	0.036					2%	9%
W17	594846	4811651	0.09	0.033					2%	8%
W18	595273	4810992	0.05	0.018					1%	4%
W19	594835	4811188	0.04	0.019					1%	5%
W5	593729	4812239	0.10	0.053					2%	13%
W9	594108	4811855	0.06	0.038					1%	10%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B10 - Summary of Participating Receptor Interpolation Results - Acetaldehyde
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives /Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	1/2-Hour	24-Hour	1/2-Hour	24-Hour			1/2-Hour	24-Hour
B1	594423	4815127	0.07	0.020	500	500	Health	AAQC	0.01%	0.00%
E16	595397	4812436	0.28	0.064					0.06%	0.01%
E19	595059	4811513	0.30	0.113					0.06%	0.02%
E20	595114	4811602	0.26	0.074					0.05%	0.01%
E6	594668	4813130	0.18	0.069					0.04%	0.01%
E9	594838	4812956	0.45	0.079					0.09%	0.02%
W10	594254	4811747	0.26	0.116					0.05%	0.02%
W11	594067	4811977	0.40	0.184					0.08%	0.04%
W12	594424	4811586	0.21	0.094					0.04%	0.02%
W13	594604	4811645	0.23	0.101					0.05%	0.02%
W17	594846	4811651	0.29	0.108					0.06%	0.02%
W18	595273	4810992	0.18	0.070					0.04%	0.01%
W19	594835	4811188	0.16	0.058					0.03%	0.01%
W5	593729	4812239	0.54	0.216					0.11%	0.04%
W9	594108	4811855	0.31	0.139					0.06%	0.03%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B11 - Summary of Participating Receptor Interpolation Results - Formaldehyde
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration (µg/m³)	Air Quality Objectives /Criteria* (µg/m³)	Limiting Effect	Regulation	% of Criteria
	UTM E (m)	UTM N (m)	24-Hour	24-Hour			24-Hour
B1	594423	4815127	0.04	65	Health	AAQC	0.1%
E16	595397	4812436	0.13				0.2%
E19	595059	4811513	0.23				0.4%
E20	595114	4811602	0.15				0.2%
E6	594668	4813130	0.14				0.2%
E9	594838	4812956	0.16				0.3%
W10	594254	4811747	0.23				0.4%
W11	594067	4811977	0.36				0.6%
W12	594424	4811586	0.18				0.3%
W13	594604	4811645	0.20				0.3%
W17	594846	4811651	0.21				0.3%
W18	595273	4810992	0.14				0.2%
W19	594835	4811188	0.11				0.2%
W5	593729	4812239	0.46				0.7%
W9	594108	4811855	0.27				0.4%

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table B12 - Summary of Participating Receptor Interpolation Results - Benzo(a)pyrene
Maximum Ground Level Concentrations at Residences Located on CN Property for CN Future Scenario - Project Only

Receptor ID	Receptor Location		Maximum Ground Level Concentration ($\mu\text{g}/\text{m}^3$)		Air Quality Objectives / Criteria* ($\mu\text{g}/\text{m}^3$)		Limiting Effect	Regulation	% of Criteria	
	UTM E (m)	UTM N (m)	24-Hour	Annual	24-Hour	Annual			24-Hour	Annual
B1	594423	4815127	0.0000143	0.00000332	0.00005	0.00001	Health	AAQC	29%	33%
E16	595397	4812436	0.0000565	0.00000761					113%	76%
E19	595059	4811513	0.0000425	0.0000102					85%	102%
E20	595114	4811602	0.0000341	0.00000801					68%	80%
E6	594668	4813130	0.0000470	0.0000128					94%	128%
E9	594838	4812956	0.0000767	0.0000124					153%	124%
W10	594254	4811747	0.0000866	0.0000164					173%	164%
W11	594067	4811977	0.000153	0.0000288					306%	288%
W12	594424	4811586	0.0000623	0.0000119					125%	119%
W13	594604	4811645	0.0000582	0.0000120					116%	120%
W17	594846	4811651	0.0000507	0.0000111					101%	111%
W18	595273	4810992	0.0000278	0.00000590					56%	59%
W19	594835	4811188	0.0000333	0.00000646					67%	65%
W5	593729	4812239	0.000262	0.0000553					524%	553%
W9	594108	4811855	0.000117	0.0000210					233%	210%

Attachment C

Attachment IR12 – Air Quality Analysis for Participating Receptors

Table C1 - Summary of Background Air Quality Levels Used for Air Emission Assessment

Contaminant	CAS	Averaging Period (hours)	Background Concentration (ug/m ³)
NO ₂	10102-44-0	1	46.8
		24	38.9
		Annual	23.0
CO	630-08-0	1	437.2
		8	413.0
SO ₂	7446-09-5	1	22.6
		24	20.6
		Annual	7.8
PM	N/A (pm)	24	n/a*
		Annual	n/a*
PM10	N/A (pm10)	24	30.7
PM2.5	N/A (pm2.5)	24	13.2
		Annual	6.9
Benzene	71-43-2	24	1.59
		Annual	0.79
1,3-Butadiene	106-99-0	24	0.09
		Annual	0.05
Acrolein	107-02-8	1	n/a*
		24	n/a*
Acetaldehyde	75-07-0	0.5	n/a*
		24	n/a*
Formaldehyde	50-00-0	24	n/a*
Benzo(a)pyrene	50-32-8	24	0.00064
		Annual	0.00025

Note:

* NAPS data for these contaminants were not available.

Attachment D

Table D1: Exposure Ratios for “Participating” Receptors during Project Operations – Short-Term Exposure

COPC	Exposure Ratio (Dimensionless)								
	Baseline			Project Alone			Baseline + Project Alone		
	1-hour	8-hour	24-hour	1-hour	8-hour	24-hour	1-hour	8-hour	24-hour
NO ₂	0.12	--	0.19	0.19	--	0.27	0.31	--	0.46
SO ₂	0.050	--	0.16	0.0011	--	0.0020	0.051	--	0.17
CO	0.012	0.028	--	0.0056	0.010	--	0.018	0.038	--
PM ₁₀	--	--	0.61	--	--	0.20	--	--	0.82
PM _{2.5}	--	--	0.49	--	--	0.27	--	--	0.76
1,3-Butadiene	--	--	0.0090	--	--	0.0020	--	--	0.011
Acrolein	--	--	--	0.023	--	0.13	0.023	--	0.13
Acetaldehyde	--	--	--	--	--	0.00043	--	--	0.00043
Formaldehyde	--	--	--	--	--	0.0071	--	--	0.0071

NOTES:

-- No health-based TRV available (see HHRA TDR, Appendix E.7, Section 5.0, page 19 to 21)

Exposure Ratio target benchmark is 1.0 (HHRA TDR, Appendix E.7, Section 6.0, page 23)

Table D2: Exposure Ratios for “Participating” Receptors during Project Operations – Long-Term Exposure

COPC	Exposure Ratio (Dimensionless)		
	Baseline	Project Alone	Baseline + Project Alone
	Annual	Annual	Annual
NO ₂	0.23	0.16	0.39
SO ₂	0.14	0.00093	0.14
CO	--	--	
PM ₁₀	--	--	
PM _{2.5}	0.78	0.18	0.96
1,3-Butadiene	0.025	0.0025	0.028
Acrolein	--	--	--
Acetaldehyde	--	--	--
Formaldehyde	--	--	--

NOTES:

-- No health-based TRV available (see HHRA TDR, Appendix E.7, Section 5.0, page 19 to 21)

Exposure Ratio target benchmark is 1.0 (HHRA TDR, Appendix E.7, Section 6.0, page 23)

Table D3: Carcinogenic Health Risks for “Participating” Receptors during Project Operations – Long-Term Exposure

COPC	Lifetime Cancer Risk (LCR or ILCR, dimensionless)		
	Baseline (LCR)	Project Alone (ILCR)	Baseline + Project Alone (LCR)
	Annual	Annual	Annual
Benzene	2.6E-06	7.5E-08	2.7E-06
Benzo(a)pyrene ^a	7.6E-09	1.7E-09	9.3E-09

NOTES:

^a As a surrogate for total Polycyclic Aromatic Hydrocarbons (PAHs)

ILCR Benchmark is 1x10E-05

ATTACHMENT IR14 – METEOROLOGICAL DATA AT PEARSON AIRPORT

Attachment IR14 - Meteorological Data at Pearson Airport (July 2014)

Station Name TORONTO INTL A
 Province ONTARIO
 Latitude 43.68
 Longitude -79.63
 Elevation 173.4
 Climate Identifier 6158731
 WMO Identifier 71624
 TC Identifier YYZ

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E Estimated
 M Missing
 NA Not Available
 ‡ Partner data that is not subject to review by the National Climate Archives

Date/Time	Year	Month	Day	Time	Data Quality	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Visibility (km)	Stn Press (kPa)	Hmdx	Wind Chill	Weather
7/16/2014 0:00	2014	7	16	0:00	‡	14.9	11	77	25	22	24.1	98.79			NA
7/16/2014 1:00	2014	7	16	1:00	‡	13.9	11.1	83	25	16	24.1	98.8			Clear
7/16/2014 2:00	2014	7	16	2:00	‡	13.2	10.8	85	27	9	24.1	98.81			NA
7/16/2014 3:00	2014	7	16	3:00	‡	13.6	10.6	82	23	6	24.1	98.8			NA
7/16/2014 4:00	2014	7	16	4:00	‡	14.3	11.5	83	23	7	24.1	98.85			Mostly Cloudy
7/16/2014 5:00	2014	7	16	5:00	‡	14.6	11.8	83	20	9	24.1	98.89			NA
7/16/2014 6:00	2014	7	16	6:00	‡	14.8	11.6	81	27	14	24.1	98.94			NA
7/16/2014 7:00	2014	7	16	7:00	‡	15.7	11.3	75	28	19	24.1	98.99			Mainly Clear
7/16/2014 8:00	2014	7	16	8:00	‡	17.3	11.2	67	29	19	24.1	99.02			NA
7/16/2014 9:00	2014	7	16	9:00	‡	17	10.9	67	28	20	24.1	99.07			NA
7/16/2014 10:00	2014	7	16	10:00	‡	19.2	11.6	61	30	21	24.1	99.07			Mainly Clear
7/16/2014 11:00	2014	7	16	11:00	‡	19.5	11.6	60	33	9	24.1	99.06			NA
7/16/2014 12:00	2014	7	16	12:00	‡	20.2	11.5	57	27	25	24.1	99.06			NA
7/16/2014 13:00	2014	7	16	13:00	‡	20	12.1	60	29	22	24.1	99.07			Mostly Cloudy
7/16/2014 14:00	2014	7	16	14:00	‡	21.3	12	55	29	12	24.1	99.07			NA
7/16/2014 15:00	2014	7	16	15:00	‡	18	15.1	83	28	23	19.3	99.11			Rain Showers
7/16/2014 16:00	2014	7	16	16:00	‡	20.3	11.1	55	28	19	24.1	99.07			Mostly Cloudy
7/16/2014 17:00	2014	7	16	17:00	‡	19.6	11.2	58	28	25	24.1	99.11			NA
7/16/2014 18:00	2014	7	16	18:00	‡	19.3	12.2	63	28	19	24.1	99.15			NA
7/16/2014 19:00	2014	7	16	19:00	‡	19	11.9	63	27	20	24.1	99.19			Mostly Cloudy
7/16/2014 20:00	2014	7	16	20:00	‡	18.8	10.5	58	29	19	24.1	99.21			NA
7/16/2014 21:00	2014	7	16	21:00	‡	17.8	11	64	32	15	24.1	99.28			NA
7/16/2014 22:00	2014	7	16	22:00	‡	16	11	72	35	12	24.1	99.33			Mainly Clear
7/16/2014 23:00	2014	7	16	23:00	‡	15.3	10.7	74	32	13	24.1	99.37			NA
7/17/2014 0:00	2014	7	17	0:00	‡	14.2	8.4	68	32	14	24.1	99.38			NA
7/17/2014 1:00	2014	7	17	1:00	‡	12.2	7.9	75	27	11	24.1	99.42			Clear
7/17/2014 2:00	2014	7	17	2:00	‡	12.9	8.2	73	30	14	24.1	99.43			NA
7/17/2014 3:00	2014	7	17	3:00	‡	11.8	8.3	79	26	5	24.1	99.44			NA
7/17/2014 4:00	2014	7	17	4:00	‡	11.4	8.1	80	27	8	24.1	99.46			Mainly Clear
7/17/2014 5:00	2014	7	17	5:00	‡	11.4	7.7	78	27	8	24.1	99.5			NA
7/17/2014 6:00	2014	7	17	6:00	‡	13.3	8.6	73	30	5	24.1	99.55			NA
7/17/2014 7:00	2014	7	17	7:00	‡	15.8	10.2	69	33	5	24.1	99.59			Mainly Clear
7/17/2014 8:00	2014	7	17	8:00	‡	18.8	9.9	56	28	12	24.1	99.62			NA
7/17/2014 9:00	2014	7	17	9:00	‡	20	9.7	51	31	9	24.1	99.64			NA
7/17/2014 10:00	2014	7	17	10:00	‡	20.9	8.7	45	29	7	24.1	99.64			Mainly Clear
7/17/2014 11:00	2014	7	17	11:00	‡	22	9.7	45	24	12	24.1	99.63			NA
7/17/2014 12:00	2014	7	17	12:00	‡	19.4	10.2	55	15	21	24.1	99.62			NA
7/17/2014 13:00	2014	7	17	13:00	‡	21.6	11.5	52	15	15	24.1	99.6			Mostly Cloudy
7/17/2014 14:00	2014	7	17	14:00	‡	20.4	11.7	57	13	12	24.1	99.61			NA
7/17/2014 15:00	2014	7	17	15:00	‡	21.5	11.7	53	14	11	24.1	99.61			NA
7/17/2014 16:00	2014	7	17	16:00	‡	23.2	8.3	38	27	22	24.1	99.61			Mostly Cloudy
7/17/2014 17:00	2014	7	17	17:00	‡	23.5	7.8	36	29	22	24.1	99.64			NA
7/17/2014 18:00	2014	7	17	18:00	‡	22.2	8.1	40	27	23	24.1	99.69			NA
7/17/2014 19:00	2014	7	17	19:00	‡	21.7	8	41	29	22	24.1	99.76			Clear
7/17/2014 20:00	2014	7	17	20:00	‡	19.9	8.1	46	28	16	24.1	99.82			NA
7/17/2014 21:00	2014	7	17	21:00	‡	18.8	8.9	52	29	12	24.1	99.89			NA

Attachment IR14 - Meteorological Data at Pearson Airport (July 2014)

Date/Time	Year	Month	Day	Time	Data Quality	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Visibility (km)	Stn Press (kPa)	Hmdx	Wind Chill	Weather
7/17/2014 22:00	2014	7	17	22:00	‡	17.8	9.5	58	31	13	24.1	99.93			Clear
7/17/2014 23:00	2014	7	17	23:00	‡	15.6	9.6	67	27	9	24.1	99.96			NA
7/18/2014 0:00	2014	7	18	0:00	‡	14.5	9.4	71	26	7	24.1	100			NA
7/18/2014 1:00	2014	7	18	1:00	‡	14.6	9.2	70	28	8	24.1	100.02			Clear
7/18/2014 2:00	2014	7	18	2:00	‡	13.9	9.2	73	30	8	24.1	100.04			NA
7/18/2014 3:00	2014	7	18	3:00	‡	13.6	9.1	74	32	9	24.1	100.08			NA
7/18/2014 4:00	2014	7	18	4:00	‡	13.7	9	73	30	5	24.1	100.13			Clear
7/18/2014 5:00	2014	7	18	5:00	‡	13.4	8.7	73	34	5	24.1	100.18			NA
7/18/2014 6:00	2014	7	18	6:00	‡	14.4	8.6	68	35	9	24.1	100.23			NA
7/18/2014 7:00	2014	7	18	7:00	‡	16.1	9.4	64	2	5	24.1	100.27			Clear
7/18/2014 8:00	2014	7	18	8:00	‡	18.6	9.8	56	22	4	24.1	100.34			NA
7/18/2014 9:00	2014	7	18	9:00	‡	21.5	8.9	44	23	5	24.1	100.34			NA
7/18/2014 10:00	2014	7	18	10:00	‡	22.4	8.7	41	36	2	24.1	100.34			Mainly Clear
7/18/2014 11:00	2014	7	18	11:00	‡	23.9	7.7	35	24	7	24.1	100.32			NA
7/18/2014 12:00	2014	7	18	12:00	‡	24.2	8	35	13	13	24.1	100.29	25		NA
7/18/2014 13:00	2014	7	18	13:00	‡	23.7	7.5	35	15	18	24.1	100.25			Mainly Clear
7/18/2014 14:00	2014	7	18	14:00	‡	23.4	6	32	17	23	24.1	100.26			NA
7/18/2014 15:00	2014	7	18	15:00	‡	23.2	5.8	32	15	22	24.1	100.23			NA
7/18/2014 16:00	2014	7	18	16:00	‡	23.5	5.6	31	13	20	24.1	100.23			Mostly Cloudy
7/18/2014 17:00	2014	7	18	17:00	‡	23.5	5.1	30	13	12	24.1	100.21			NA
7/18/2014 18:00	2014	7	18	18:00	‡	22.9	4.6	30	13	16	24.1	100.19			NA
7/18/2014 19:00	2014	7	18	19:00	‡	22	3.8	30	15	14	24.1	100.2			Mostly Cloudy
7/18/2014 20:00	2014	7	18	20:00	‡	20.2	5.2	37	14	8	24.1	100.18			NA
7/18/2014 21:00	2014	7	18	21:00	‡	19.7	8.2	47	13	7	24.1	100.23			NA
7/18/2014 22:00	2014	7	18	22:00	‡	19.2	9.5	53	12	7	24.1	100.23			Mostly Cloudy
7/18/2014 23:00	2014	7	18	23:00	‡	18.8	10.2	57	10	5	24.1	100.22			NA
7/19/2014 0:00	2014	7	19	0:00	‡	18.7	9.3	54	9	7	24.1	100.23			NA
7/19/2014 1:00	2014	7	19	1:00	‡	18.2	10.9	62	2	4	24.1	100.21			Cloudy
7/19/2014 2:00	2014	7	19	2:00	‡	16.9	11	68	2	8	24.1	100.18			NA
7/19/2014 3:00	2014	7	19	3:00	‡	17.2	11.8	70	3	5	24.1	100.17			NA
7/19/2014 4:00	2014	7	19	4:00	‡	16.7	11.7	72	4	9	24.1	100.16			Mostly Cloudy
7/19/2014 5:00	2014	7	19	5:00	‡	16.3	11.9	75	4	8	24.1	100.18			NA
7/19/2014 6:00	2014	7	19	6:00	‡	17.2	12	71	6	7	24.1	100.16			NA
7/19/2014 7:00	2014	7	19	7:00	‡	17.5	11.6	68	5	11	24.1	100.19			Mostly Cloudy
7/19/2014 8:00	2014	7	19	8:00	‡	18.8	12.2	65	14	8	24.1	100.22			NA
7/19/2014 9:00	2014	7	19	9:00	‡	19.6	12.7	64	10	11	24.1	100.19			NA
7/19/2014 10:00	2014	7	19	10:00	‡	21.1	14.1	64	10	15	24.1	100.16	25		Cloudy
7/19/2014 11:00	2014	7	19	11:00	‡	21.1	14.1	64	14	14	24.1	100.12	25		NA
7/19/2014 12:00	2014	7	19	12:00	‡	20.8	15.7	72	14	10	24.1	100.08	25		Rain Showers
7/19/2014 13:00	2014	7	19	13:00	‡	19.8	16.3	80	13	14	24.1	100.08			Rain Showers
7/19/2014 14:00	2014	7	19	14:00	‡	19.6	17.4	87	13	11	16.1	100.04			Rain Showers
7/19/2014 15:00	2014	7	19	15:00	‡	19.2	17.6	90	11	11	16.1	100			Rain Showers
7/19/2014 16:00	2014	7	19	16:00	‡	19.2	17.4	89	10	14	12.9	99.97			Rain Showers
7/19/2014 17:00	2014	7	19	17:00	‡	18.5	17.4	93	10	14	4.8	99.94			Rain,Fog
7/19/2014 18:00	2014	7	19	18:00	‡	18.3	17.2	93	10	14	6.4	99.92			Rain,Fog
7/19/2014 19:00	2014	7	19	19:00	‡	17.7	16.7	94	9	15	4.8	99.91			Rain,Fog
7/19/2014 20:00	2014	7	19	20:00	‡	17.4	16.6	95	8	17	4	99.89			Moderate Rain,Fog
7/19/2014 21:00	2014	7	19	21:00	‡	17.9	17.1	95	12	17	8.1	99.9			Rain,Fog
7/19/2014 22:00	2014	7	19	22:00	‡	17.9	17.1	95	12	14	6.4	99.85			Rain,Fog
7/19/2014 23:00	2014	7	19	23:00	‡	17.5	16.5	94	12	13	6.4	99.83			Rain,Fog
7/20/2014 0:00	2014	7	20	0:00	‡	17.4	16.4	94	12	11	8.1	99.8			Fog
7/20/2014 1:00	2014	7	20	1:00	‡	17.3	16.3	94	12	9	8.1	99.77			Fog
7/20/2014 2:00	2014	7	20	2:00	‡	17.5	16.5	94	13	8	8.1	99.73			Fog
7/20/2014 3:00	2014	7	20	3:00	‡	17.6	16.6	94	11	10	8.1	99.72			Fog
7/20/2014 4:00	2014	7	20	4:00	‡	17.5	16.5	94	12	11	8.1	99.72			Fog
7/20/2014 5:00	2014	7	20	5:00	‡	17.7	16.7	94	12	9	4.8	99.74			Fog
7/20/2014 6:00	2014	7	20	6:00	‡	17.9	16.8	93	12	8	9.7	99.77			Fog
7/20/2014 7:00	2014	7	20	7:00	‡	18.4	17.1	92	13	6	9.7	99.81			Fog
7/20/2014 8:00	2014	7	20	8:00	‡	18.9	17.6	92	14	11	8.1	99.83			Fog
7/20/2014 9:00	2014	7	20	9:00	‡	19.5	17.7	89	15	8	8.1	99.84			Fog
7/20/2014 10:00	2014	7	20	10:00	‡	20.3	18.1	87	13	9	9.7	99.83	26		Fog
7/20/2014 11:00	2014	7	20	11:00	‡	22.3	18.4	78	14	8	12.9	99.82	29		NA

Attachment IR14 - Meteorological Data at Pearson Airport (July 2014)

Date/Time	Year	Month	Day	Time	Data Quality	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Visibility (km)	Stn Press (kPa)	Hmdx	Wind Chill	Weather
7/20/2014 12:00	2014	7	20	12:00	‡	22.5	18.1	76	16	13	19.3	99.8	29		NA
7/20/2014 13:00	2014	7	20	13:00	‡	22	18.1	78	15	13	24.1	99.78	28		Cloudy
7/20/2014 14:00	2014	7	20	14:00	‡	21.9	18	78	18	12	24.1	99.77	28		NA
7/20/2014 15:00	2014	7	20	15:00	‡	20.3	19.2	93	18	11	8.1	99.77	27		Rain Showers
7/20/2014 16:00	2014	7	20	16:00	‡	20.8	18.2	85	13	7	24.1	99.74	27		Cloudy
7/20/2014 17:00	2014	7	20	17:00	‡	21.7	18.6	82	14	7	24.1	99.71	28		NA
7/20/2014 18:00	2014	7	20	18:00	‡	21.8	18.5	81	14	13	24.1	99.73	28		NA
7/20/2014 19:00	2014	7	20	19:00	‡	20.8	17.7	82	14	13	19.3	99.74	27		Mainly Clear
7/20/2014 20:00	2014	7	20	20:00	‡	19.7	17.2	85	14	11	19.3	99.75			NA
7/20/2014 21:00	2014	7	20	21:00	‡	19.3	16.9	86	12	9	19.3	99.8			NA
7/20/2014 22:00	2014	7	20	22:00	‡	19.1	16.9	87	11	8	24.1	99.82			Mainly Clear
7/20/2014 23:00	2014	7	20	23:00	‡	18.3	16.7	90	2	7	19.3	99.81			NA
7/21/2014 0:00	2014	7	21	0:00	‡	18.3	16.7	90	4	4	19.3	99.8			NA
7/21/2014 1:00	2014	7	21	1:00	‡	18.2	16.7	91	7	3	16.1	99.79			Mainly Clear
7/21/2014 2:00	2014	7	21	2:00	‡	17.8	16.5	92	36	3	16.1	99.79			NA
7/21/2014 3:00	2014	7	21	3:00	‡	16.6	15.6	94	0	1	12.9	99.81			NA
7/21/2014 4:00	2014	7	21	4:00	‡	15.7	14.8	94	31	4	12.9	99.84			Clear
7/21/2014 5:00	2014	7	21	5:00	‡	16.6	15.6	94	33	7	8.1	99.88			Fog
7/21/2014 6:00	2014	7	21	6:00	‡	16.7	15.9	95	28	13	0.4	99.95			Fog
7/21/2014 7:00	2014	7	21	7:00	‡	17.6	17.1	97	36	2	0.4	99.99			Fog
7/21/2014 8:00	2014	7	21	8:00	‡	19.7	18.7	94	26	6	6.4	100.01			Fog
7/21/2014 9:00	2014	7	21	9:00	‡	22.2	18.8	81	36	3	24.1	99.96	29		NA
7/21/2014 10:00	2014	7	21	10:00	‡	24.2	18.9	72	26	6	24.1	99.96	31		Mainly Clear
7/21/2014 11:00	2014	7	21	11:00	‡	25.4	17.2	60	33	3	24.1	99.96	31		NA
7/21/2014 12:00	2014	7	21	12:00	‡	25.3	18.6	66	14	15	24.1	99.95	32		NA
7/21/2014 13:00	2014	7	21	13:00	‡	26.3	19.1	64	14	14	24.1	99.92	33		Mainly Clear
7/21/2014 14:00	2014	7	21	14:00	‡	26.6	18.4	60	15	15	24.1	99.9	33		NA
7/21/2014 15:00	2014	7	21	15:00	‡	26.8	17.5	56	14	18	24.1	99.89	32		NA
7/21/2014 16:00	2014	7	21	16:00	‡	26.8	16.3	52	14	13	24.1	99.85	32		Mainly Clear
7/21/2014 17:00	2014	7	21	17:00	‡	27.3	15.9	49	16	13	24.1	99.83	32		NA
7/21/2014 18:00	2014	7	21	18:00	‡	26.6	14.9	48	15	14	24.1	99.83	31		NA
7/21/2014 19:00	2014	7	21	19:00	‡	24.1	16.5	62	15	14	24.1	99.85	29		Mainly Clear
7/21/2014 20:00	2014	7	21	20:00	‡	23.1	16.7	67	16	9	24.1	99.85	28		NA
7/21/2014 21:00	2014	7	21	21:00	‡	22.5	16.4	68	14	8	24.1	99.92	27		NA
7/21/2014 22:00	2014	7	21	22:00	‡	22.7	16.1	66	15	5	24.1	99.92	27		Mainly Clear
7/21/2014 23:00	2014	7	21	23:00	‡	22.3	16.2	68	36	2	24.1	99.91	27		NA
7/22/2014 0:00	2014	7	22	0:00	‡	21.9	16.3	70	36	1	24.1	99.91	27		NA
7/22/2014 1:00	2014	7	22	1:00	‡	20.5	16.6	78	36	2	24.1	99.89	26		Clear
7/22/2014 2:00	2014	7	22	2:00	‡	19.8	17.3	85	16	7	24.1	99.88			NA
7/22/2014 3:00	2014	7	22	3:00	‡	19.5	17.7	89	16	4	24.1	99.87			NA
7/22/2014 4:00	2014	7	22	4:00	‡	19	17.9	93	22	3	16.1	99.89			Clear
7/22/2014 5:00	2014	7	22	5:00	‡	19.3	17.5	89	18	3	9.7	99.89			Fog
7/22/2014 6:00	2014	7	22	6:00	‡	20	16.9	82	29	10	12.9	99.93	25		NA
7/22/2014 7:00	2014	7	22	7:00	‡	21.9	17.6	76	25	4	16.1	99.94	28		Clear
7/22/2014 8:00	2014	7	22	8:00	‡	23.8	17.9	69	30	4	24.1	99.95	30		NA
7/22/2014 9:00	2014	7	22	9:00	‡	26.1	17.6	59	21	8	24.1	99.89	32		NA
7/22/2014 10:00	2014	7	22	10:00	‡	26.7	18.7	61	14	11	24.1	99.84	33		Clear
7/22/2014 11:00	2014	7	22	11:00	‡	27.7	18.3	56	17	13	24.1	99.75	34		NA
7/22/2014 12:00	2014	7	22	12:00	‡	27.9	15.1	45	14	21	24.1	99.69	32		NA
7/22/2014 13:00	2014	7	22	13:00	‡	28.1	15.6	46	15	18	24.1	99.63	32		Clear
7/22/2014 14:00	2014	7	22	14:00	‡	29.1	15.9	44	14	18	24.1	99.55	34		NA
7/22/2014 15:00	2014	7	22	15:00	‡	29.8	15.4	41	16	19	24.1	99.47	34		NA
7/22/2014 16:00	2014	7	22	16:00	‡	29.1	16.9	47	16	18	24.1	99.46	34		Clear
7/22/2014 17:00	2014	7	22	17:00	‡	28.4	16.6	48	16	21	24.1	99.44	33		NA
7/22/2014 18:00	2014	7	22	18:00	‡	29.5	17.6	48	23	25	24.1	99.39	35		NA
7/22/2014 19:00	2014	7	22	19:00	‡	28.3	18	53	22	24	24.1	99.32	34		Mainly Clear
7/22/2014 20:00	2014	7	22	20:00	‡	27.3	18.8	59	20	17	24.1	99.22	34		NA
7/22/2014 21:00	2014	7	22	21:00	‡	26.5	18.5	61	22	20	24.1	99.29	33		NA
7/22/2014 22:00	2014	7	22	22:00	‡	26.1	18.6	63	21	20	24.1	99.27	33		Mostly Cloudy
7/22/2014 23:00	2014	7	22	23:00	‡	25.5	19	67	14	9	16.1	99.3	32		Thunderstorms,Rain Showers

Attachment IR14 - Meteorological Data at Pearson Airport (June 2015)

Station Name TORONTO INTL A
 Province ONTARIO
 Latitude 43.68
 Longitude -79.63
 Elevation 173.4
 Climate Identifier 6158731
 WMO Identifier 71624
 TC Identifier YYZ

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E Estimated
 M Missing
 NA Not Available
 ‡ Partner data that is not subject to review by the National Climate Archives

Date/Time	Year	Month	Day	Time	Data Quality	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Visibility (km)	Stn Press (kPa)	Hmdx	Wind Chill	Weather
6/3/2015 0:00	2015	6	3	0:00	‡	11.1	5.9	70	9	9	24.1	100.23			NA
6/3/2015 1:00	2015	6	3	1:00	‡	11.8	5.5	65	12	13	24.1	100.22			Clear
6/3/2015 2:00	2015	6	3	2:00	‡	11.1	5.7	69	10	5	24.1	100.2			NA
6/3/2015 3:00	2015	6	3	3:00	‡	10.4	5.6	72	9	5	24.1	100.2			NA
6/3/2015 4:00	2015	6	3	4:00	‡	10	5.8	75	8	7	24.1	100.21			Mainly Clear
6/3/2015 5:00	2015	6	3	5:00	‡	8.8	5.6	80	4	9	24.1	100.26			NA
6/3/2015 6:00	2015	6	3	6:00	‡	11.3	7.1	75	6	8	24.1	100.3			NA
6/3/2015 7:00	2015	6	3	7:00	‡	13.1	7.2	67	12	13	24.1	100.3			Clear
6/3/2015 8:00	2015	6	3	8:00	‡	14.6	7.2	61	13	12	24.1	100.34			NA
6/3/2015 9:00	2015	6	3	9:00	‡	15.7	6	52	13	14	24.1	100.31			NA
6/3/2015 10:00	2015	6	3	10:00	‡	17.4	5.8	46	10	14	24.1	100.26			Clear
6/3/2015 11:00	2015	6	3	11:00	‡	18.1	4.1	39	13	14	24.1	100.24			NA
6/3/2015 12:00	2015	6	3	12:00	‡	18.3	6	44	12	15	24.1	100.21			NA
6/3/2015 13:00	2015	6	3	13:00	‡	18.6	5.6	42	13	17	24.1	100.14			Mainly Clear
6/3/2015 14:00	2015	6	3	14:00	‡	18.8	6.7	45	11	14	24.1	100.08			NA
6/3/2015 15:00	2015	6	3	15:00	‡	19.2	5.4	40	11	17	24.1	100.06			NA
6/3/2015 16:00	2015	6	3	16:00	‡	18.7	5.3	41	11	10	24.1	100			Mainly Cloudy
6/3/2015 17:00	2015	6	3	17:00	‡	18.6	5.6	42	8	15	24.1	99.95			NA
6/3/2015 18:00	2015	6	3	18:00	‡	18	5	42	7	17	24.1	99.95			NA
6/3/2015 19:00	2015	6	3	19:00	‡	16.9	5.3	46	9	17	24.1	99.96			Mainly Clear
6/3/2015 20:00	2015	6	3	20:00	‡	15.6	6.1	53	8	11	24.1	99.96			NA
6/3/2015 21:00	2015	6	3	21:00	‡	14.8	6.2	56	9	9	24.1	99.98			NA
6/3/2015 22:00	2015	6	3	22:00	‡	14.3	6	57	8	6	24.1	99.99			Mainly Clear
6/3/2015 23:00	2015	6	3	23:00	‡	14	6.2	59	7	7	24.1	99.97			NA
6/4/2015 0:00	2015	6	4	0:00	‡	13.6	6.5	62	8	9	24.1	99.92			NA
6/4/2015 1:00	2015	6	4	1:00	‡	13	6.9	66	5	5	24.1	99.91			Clear
6/4/2015 2:00	2015	6	4	2:00	‡	12.9	7.2	68	4	5	24.1	99.89			NA
6/4/2015 3:00	2015	6	4	3:00	‡	12.4	7.3	71	10	6	24.1	99.87			NA
6/4/2015 4:00	2015	6	4	4:00	‡	11.8	7.4	74	2	4	24.1	99.88			Clear
6/4/2015 5:00	2015	6	4	5:00	‡	11.6	7.6	76	3	5	24.1	99.9			NA
6/4/2015 6:00	2015	6	4	6:00	‡	12.9	9	77	4	7	24.1	99.93			NA
6/4/2015 7:00	2015	6	4	7:00	‡	14.7	9.6	71	3	4	24.1	99.98			Mainly Clear
6/4/2015 8:00	2015	6	4	8:00	‡	16.3	10	66	16	7	24.1	100.02			NA
6/4/2015 9:00	2015	6	4	9:00	‡	16.9	10.4	65	14	13	24.1	100.02			NA
6/4/2015 10:00	2015	6	4	10:00	‡	17.5	11.2	66	13	15	24.1	100			Mainly Clear
6/4/2015 11:00	2015	6	4	11:00	‡	18.4	12.2	67	14	16	24.1	99.97			NA
6/4/2015 12:00	2015	6	4	12:00	‡	18.2	12.1	67	14	17	24.1	99.95			NA
6/4/2015 13:00	2015	6	4	13:00	‡	19.1	13.4	69	14	15	24.1	99.89			Mainly Clear
6/4/2015 14:00	2015	6	4	14:00	‡	20.7	13.5	63	14	17	24.1	99.82			NA
6/4/2015 15:00	2015	6	4	15:00	‡	22.4	14.9	62	16	13	24.1	99.78	26		NA
6/4/2015 16:00	2015	6	4	16:00	‡	20.8	13.8	64	13	14	24.1	99.77			Mainly Cloudy
6/4/2015 17:00	2015	6	4	17:00	‡	20.8	13.8	64	13	15	24.1	99.74			NA
6/4/2015 18:00	2015	6	4	18:00	‡	19.2	13	67	15	15	24.1	99.71			NA
6/4/2015 19:00	2015	6	4	19:00	‡	18.5	13	70	16	11	24.1	99.72			Mainly Cloudy
6/4/2015 20:00	2015	6	4	20:00	‡	17	12.6	75	15	12	24.1	99.7			NA
6/4/2015 21:00	2015	6	4	21:00	‡	15.6	11.8	78	16	6	24.1	99.74			NA
6/4/2015 22:00	2015	6	4	22:00	‡	15.6	11.8	78	14	5	24.1	99.71			Mainly Cloudy
6/4/2015 23:00	2015	6	4	23:00	‡	15.9	11.9	77	17	3	24.1	99.66			NA

Attachment IR14 - Meteorological Data at Pearson Airport (June 2015)

Date/Time	Year	Month	Day	Time	Data Quality	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Visibility (km)	Stn Press (kPa)	Hmdx	Wind Chill	Weather
6/5/2015 0:00	2015	6	5	0:00	†	16.1	12.3	78	36	2	24.1	99.63			NA
6/5/2015 1:00	2015	6	5	1:00	†	16.2	12.8	80	36	2	24.1	99.6			Mostly Cloudy
6/5/2015 2:00	2015	6	5	2:00	†	15.7	12.7	82	36	1	24.1	99.63			NA
6/5/2015 3:00	2015	6	5	3:00	†	15	12.2	83	15	8	24.1	99.57			NA
6/5/2015 4:00	2015	6	5	4:00	†	14.4	11.8	84	20	4	24.1	99.53			Mostly Cloudy
6/5/2015 5:00	2015	6	5	5:00	†	13.8	11.5	86	15	5	24.1	99.52			NA
6/5/2015 6:00	2015	6	5	6:00	†	15.4	12	80	15	8	24.1	99.54			NA
6/5/2015 7:00	2015	6	5	7:00	†	16.9	13.1	78	18	4	24.1	99.55			Mostly Cloudy
6/5/2015 8:00	2015	6	5	8:00	†	20	15.3	74	20	8	24.1	99.52			NA
6/5/2015 9:00	2015	6	5	9:00	†	21.7	16.1	70	22	7	24.1	99.5	26		NA
6/5/2015 10:00	2015	6	5	10:00	†	22.4	15.4	64	16	12	24.1	99.45	27		Cloudy
6/5/2015 11:00	2015	6	5	11:00	†	22.9	15.8	64	15	13	24.1	99.41	27		NA
6/5/2015 12:00	2015	6	5	12:00	†	24	16.4	62	14	17	24.1	99.36	29		NA
6/5/2015 13:00	2015	6	5	13:00	†	24.3	16.9	63	19	17	24.1	99.34	30		Cloudy
6/5/2015 14:00	2015	6	5	14:00	†	23.6	16.5	64	16	17	24.1	99.27	29		NA
6/5/2015 15:00	2015	6	5	15:00	†	21.1	18	82	34	30	8.1	99.32	27		Thunderstorms, Heavy Rain Showers
6/5/2015 16:00	2015	6	5	16:00	†	20.2	18	87	36	22	24.1	99.3	26		Cloudy
6/5/2015 17:00	2015	6	5	17:00	†	19.9	16.4	80	35	24	19.3	99.34			NA
6/5/2015 18:00	2015	6	5	18:00	†	20.3	16	76	34	29	24.1	99.34	25		NA
6/5/2015 19:00	2015	6	5	19:00	†	18.9	15.4	80	35	23	24.1	99.41			Mostly Cloudy
6/5/2015 20:00	2015	6	5	20:00	†	18.5	13.8	74	36	26	56.3	99.48			NA
6/5/2015 21:00	2015	6	5	21:00	†	18	12.5	70	1	24	24.1	99.58			NA
6/5/2015 22:00	2015	6	5	22:00	†	16.8	13.8	82	35	21	24.1	99.64			Mostly Cloudy
6/5/2015 23:00	2015	6	5	23:00	†	16.8	13.4	80	1	19	24.1	99.67			NA
6/6/2015 0:00	2015	6	6	0:00	†	16.2	11.8	75	1	23	24.1	99.71			NA
6/6/2015 1:00	2015	6	6	1:00	†	14.9	11.3	79	1	23	24.1	99.74			Mainly Clear
6/6/2015 2:00	2015	6	6	2:00	†	13.5	9	74	1	26	24.1	99.79			NA
6/6/2015 3:00	2015	6	6	3:00	†	12.3	7.8	74	1	24	24.1	99.83			NA
6/6/2015 4:00	2015	6	6	4:00	†	11.3	7.1	75	36	26	24.1	99.89			Mainly Clear
6/6/2015 5:00	2015	6	6	5:00	†	10.5	6.5	76	36	22	24.1	99.96			NA
6/6/2015 6:00	2015	6	6	6:00	†	10.9	5.5	69	1	22	24.1	100.06			NA
6/6/2015 7:00	2015	6	6	7:00	†	11.8	4.3	60	2	24	24.1	100.16			Clear
6/6/2015 8:00	2015	6	6	8:00	†	12.4	3.9	56	1	20	24.1	100.22			NA
6/6/2015 9:00	2015	6	6	9:00	†	13.3	4	53	4	10	24.1	100.22			NA
6/6/2015 10:00	2015	6	6	10:00	†	14.8	4	48	3	15	24.1	100.2			Mainly Clear
6/6/2015 11:00	2015	6	6	11:00	†	15.5	5.5	51	11	13	24.1	100.19			NA
6/6/2015 12:00	2015	6	6	12:00	†	15.2	5.2	51	15	17	24.1	100.18			NA
6/6/2015 13:00	2015	6	6	13:00	†	15.3	5	50	15	13	24.1	100.19			Mainly Clear
6/6/2015 14:00	2015	6	6	14:00	†	16.3	5.4	48	14	14	24.1	100.14			NA
6/6/2015 15:00	2015	6	6	15:00	†	15.8	5.2	49	14	15	24.1	100.06			NA
6/6/2015 16:00	2015	6	6	16:00	†	16.3	5.1	47	15	12	24.1	100.07			Mainly Clear
6/6/2015 17:00	2015	6	6	17:00	†	16.7	4.5	44	14	14	24.1	100.01			NA
6/6/2015 18:00	2015	6	6	18:00	†	16	4.2	45	15	12	24.1	99.98			NA
6/6/2015 19:00	2015	6	6	19:00	†	14.9	2.5	43	17	10	24.1	100.02			Mostly Cloudy
6/6/2015 20:00	2015	6	6	20:00	†	14.3	2.6	45	17	7	24.1	100			NA
6/6/2015 21:00	2015	6	6	21:00	†	14.2	1.2	41	18	6	24.1	100			NA
6/6/2015 22:00	2015	6	6	22:00	†	13.8	1.2	42	17	3	24.1	99.97			Mainly Clear
6/6/2015 23:00	2015	6	6	23:00	†	13.9	0.6	40	36	3	24.1	99.98			NA
6/7/2015 0:00	2015	6	7	0:00	†	13.2	1.9	46	6	5	24.1	99.95			NA
6/7/2015 1:00	2015	6	7	1:00	†	12.1	2.3	51	8	3	24.1	99.89			Mainly Clear
6/7/2015 2:00	2015	6	7	2:00	†	11.3	2.6	55	10	7	24.1	99.85			NA
6/7/2015 3:00	2015	6	7	3:00	†	10.5	3.6	62	11	5	24.1	99.8			NA
6/7/2015 4:00	2015	6	7	4:00	†	9.6	3.8	67	12	8	24.1	99.8			Mainly Clear
6/7/2015 5:00	2015	6	7	5:00	†	9.6	4.2	69	11	6	24.1	99.8			NA
6/7/2015 6:00	2015	6	7	6:00	†	10.9	4.8	66	10	9	24.1	99.72			NA
6/7/2015 7:00	2015	6	7	7:00	†	13	4.5	56	13	13	24.1	99.72			Mainly Clear
6/7/2015 8:00	2015	6	7	8:00	†	14.1	5	54	15	10	24.1	99.63			NA
6/7/2015 9:00	2015	6	7	9:00	†	15.5	6.6	55	16	10	24.1	99.57			NA
6/7/2015 10:00	2015	6	7	10:00	†	16.3	6.2	51	14	15	24.1	99.49			Mainly Clear
6/7/2015 11:00	2015	6	7	11:00	†	17.7	7.3	50	14	9	24.1	99.4			NA
6/7/2015 12:00	2015	6	7	12:00	†	19.2	7.7	47	14	15	24.1	99.31			NA
6/7/2015 13:00	2015	6	7	13:00	†	20.2	8.4	46	15	18	24.1	99.23			Mostly Cloudy
6/7/2015 14:00	2015	6	7	14:00	†	19.3	8.1	48	15	22	24.1	99.17			NA
6/7/2015 15:00	2015	6	7	15:00	†	17.4	7.3	51	13	21	24.1	99.08			NA

Date/Time	Year	Month	Day	Time	Data Quality	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Dir (10s deg)	Wind Spd (km/h)	Visibility (km)	Stn Press (kPa)	Hmdx	Wind Chill	Weather
6/7/2015 16:00	2015	6	7	16:00	‡	19.4	9.7	53	13	21	24.1	98.97			Cloudy
6/7/2015 17:00	2015	6	7	17:00	‡	19.4	10	54	13	16	24.1	98.86			NA
6/7/2015 18:00	2015	6	7	18:00	‡	19	10.4	57	14	15	24.1	98.77			NA
6/7/2015 19:00	2015	6	7	19:00	‡	17.1	10.8	66	12	10	24.1	98.67			Cloudy
6/7/2015 20:00	2015	6	7	20:00	‡	16.6	10.7	68	16	11	16.1	98.59			Rain
6/7/2015 21:00	2015	6	7	21:00	‡	15.6	12	79	18	5	16.1	98.61			Moderate Rain
6/7/2015 22:00	2015	6	7	22:00	‡	17.5	14.4	82	19	14	24.1	98.56			Mostly Cloudy
6/7/2015 23:00	2015	6	7	23:00	‡	19.1	16.4	84	19	13	24.1	98.54			NA
6/8/2015 0:00	2015	6	8	0:00	‡	19.4	16.5	83	17	8	24.1	98.44			NA
6/8/2015 1:00	2015	6	8	1:00	‡	19.6	18.6	94	21	18	9.7	98.41			Thunderstorms, Heavy Rain Showers
6/8/2015 2:00	2015	6	8	2:00	‡	19.8	18.8	94	20	14	6.4	98.33			Heavy Rain Showers
6/8/2015 3:00	2015	6	8	3:00	‡	19.9	18.6	92	20	10	24.1	98.23			NA
6/8/2015 4:00	2015	6	8	4:00	‡	19.9	18.4	91	23	18	24.1	98.22			Rain Showers
6/8/2015 5:00	2015	6	8	5:00	‡	20.2	18.7	91	21	16	24.1	98.24	27		NA
6/8/2015 6:00	2015	6	8	6:00	‡	20.1	18.6	91	22	21	9.7	98.21	27		Fog
6/8/2015 7:00	2015	6	8	7:00	‡	19.2	17.9	92	25	28	8.1	98.25			Rain, Fog
6/8/2015 8:00	2015	6	8	8:00	‡	19.3	18	92	27	16	19.3	98.29			NA
6/8/2015 9:00	2015	6	8	9:00	‡	19.2	17.6	90	23	12	12.9	98.33			Rain
6/8/2015 10:00	2015	6	8	10:00	‡	20	18.5	91	22	16	24.1	98.28	26		Mostly Cloudy
6/8/2015 11:00	2015	6	8	11:00	‡	20.5	18.8	90	28	18	24.1	98.34	27		Rain Showers
6/8/2015 12:00	2015	6	8	12:00	‡	21.1	16.8	76	28	13	24.1	98.34	26		NA
6/8/2015 13:00	2015	6	8	13:00	‡	21.8	17.9	78	25	19	24.1	98.4	28		Mostly Cloudy
6/8/2015 14:00	2015	6	8	14:00	‡	22	15.5	66	24	21	24.1	98.41	26		NA
6/8/2015 15:00	2015	6	8	15:00	‡	22	15.9	68	24	17	24.1	98.39	27		NA
6/8/2015 16:00	2015	6	8	16:00	‡	22.2	14.7	62	26	17	24.1	98.35	26		Mostly Cloudy
6/8/2015 17:00	2015	6	8	17:00	‡	22.9	15.8	64	25	16	24.1	98.33	27		NA
6/8/2015 18:00	2015	6	8	18:00	‡	21.8	15.7	68	25	10	24.1	98.31	26		NA
6/8/2015 19:00	2015	6	8	19:00	‡	22.1	15.3	65	21	12	24.1	98.25	26		Mostly Cloudy
6/8/2015 20:00	2015	6	8	20:00	‡	21	17.3	79	16	12	24.1	98.17	26		NA
6/8/2015 21:00	2015	6	8	21:00	‡	19	16.5	85	16	9	24.1	98.25			NA
6/8/2015 22:00	2015	6	8	22:00	‡	17.8	16.2	90	10	4	19.3	98.28			Cloudy
6/8/2015 23:00	2015	6	8	23:00	‡	17.1	16	93	15	4	16.1	98.28			NA

ATTACHMENT IR15 – SUPPLEMENTAL HYDROGEOLOGICAL CONDITIONS

Attachment IR15 – Supplemental Hydrogeological Conditions

Prepared on May 18, 2016

The following supplemental information is provided in response to IR15 of the additional information request received from the Canadian Environmental Assessment Agency (CEAA) on March 15, 2016.

INTRODUCTION

The Hydrogeology TDR (Appendix E.6) provides a characterization of the geological and hydrogeological conditions throughout the Project Development Area (PDA). Specifically, the TDR discusses groundwater depth, flow and quality conditions observed across the PDA during the period from June to September 2015 and includes an assessment of the potential interactions occurring between the groundwater system and the section of Indian Creek that passes through these lands.

The results to date provide sufficient evidence to confirm the assumptions made in the EIS. The on-going monitoring currently being completed will be used as a base for long-term monitoring during construction and operation.

FOLLOWUP GROUNDWATER MONITORING RESULTS

Groundwater Levels

Tables 1 and 2 (Attachment A) provide a summary of manual groundwater level measurements obtained from the onsite monitoring wells and drive-point piezometers (**Figure IR# 15-1, Attachment B**) collected from June 2015 to April 2016. Results of the continuous water level monitoring completed over this same period are presented on the hydrographs provided in **Figures IR# 15-2 to IR# 15-8 (Attachment B)**.

In general, the timing and magnitude of groundwater level increases and decreases in the subsurface deposits of silt, clay and sandy to silty clay till (i.e., Halton Till) across the PDA coincide with variations in climatic conditions. From June to October 2015, groundwater levels across the PDA experienced a steady decline as more moisture is lost from the soil in order to meet greater evapotranspiration demands. Groundwater levels began to rise again in late October following an approximately 46 mm precipitation event, with this rise being sustained throughout the remainder of the monitoring period due to decreasing evapotranspiration demands together with the infiltration of snowmelt water during the spring. Overall, this trend in seasonal groundwater level fluctuations is common in shallow aquifer systems throughout southern Ontario.

In late April 2016, groundwater levels ranged from artesian conditions at MW206 to 5.38 m BGS (MW214) (**Table 1, Attachment A**) and represented the high groundwater condition across the PDA based on the data collected to date. Along the section of Indian Creek that passes through the PDA, groundwater levels remained predominantly below the watercourse over the monitoring period, but did rise above the creek substrate during the spring freshet (i.e., late February to April) at DP1-15, DP3-15 and DP5-15 (**Figures IR# 15-7 and IR# 15-8, Attachment B**). Regardless, vertical hydraulic gradients remained predominantly downward at these locations, confirming that Indian Creek functions largely as a losing stream (i.e., groundwater recharge feature).

Groundwater Flow

Figure IR# 15-9 (Attachment B) presents the groundwater elevation contours and the interpreted direction of horizontal flow through the overburden deposits beneath the PDA

Attachment IR15 – Supplemental Hydrogeological Conditions

Prepared on May 18, 2016

using water level measurements collected from the onsite monitoring wells in late April 2016. Similar to groundwater mapping presented in the TDR for July 2015, the groundwater contours continue to follow the prevailing topography of the PDA, with flow moving in a southerly direction across these lands towards Tremaine Road. These local patterns in groundwater flow remain in general agreement with regional flow mapping presented by the Halton-Hamilton Source Protection Committee (2015¹), which indicates horizontal flow occurs through the overburden and to the south-southeast towards Lake Ontario.

As mentioned, groundwater levels did rise above the substrate in sections of Indian Creek in the vicinity of DP1-15, DP3-15 and DP5-15 during the spring freshet period (i.e., late February to April 2016) (**Figures IR# 15-7 and IR# 15-8, Attachment B**). During this period, vertical hydraulic gradients remain predominantly downward at these locations, meaning surface water is infiltrating from the creek to the subsurface and recharging the underlying groundwater system. Periodically, the vertical hydraulic gradients do reverse upward (i.e., groundwater discharge condition) (**Table 2, Attachment A**); however, the volumetric contribution of groundwater discharge to Indian Creek (i.e., baseflow) during the spring freshet is minimal compared to flow volumes provided by surface runoff inputs, given groundwater flows through the silt to clay deposits of the Halton Till at a calculated linear velocity of 4.8×10^{-10} m/s. Stantec notes that the maintenance of flows within a watercourse from baseflow contributions is typically most critical during the summer to early fall and monitoring data collected during this period shows the groundwater table does not intercept Indian Creek during this timeframe.

Consequently, it remains Stantec's opinion that any diversion of groundwater flow away from Indian Creek is unlikely. However, should such an event occur as a result of Project activities, there would be no residual effect on the hydraulic function of Indian Creek.

Groundwater Quality

A comparison of groundwater quality results collected from onsite monitoring wells in June / July 2015 and April 2016 (**Table 3, Attachment A**) indicate no notable changes in the chemical composition of the groundwater system across the PDA as described in the TDR.

CONCLUSION

The data provided in this followup document confirms the information presented in the EIS remains consistent with site conditions and findings presented in the EIS remain supported.

¹ Halton-Hamilton Source Protection Committee (HHSPC). 2015. Assessment Report for the Halton Region Source Protection Area, Version 3.3 (July 24, 2015). Approved by the Ministry of the Environment and Climate Change (August 5, 2015).

Attachment A - Tables

TABLE 1
GROUNDWATER LEVEL DATA - MONITORING WELLS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Well ID	UTM Coordinates		Date	Time	Well Depth		Top of Casing Elevation (m AMSL)	Ground Surface Elevation (m AMSL)	Pipe Stick-up (m)	Groundwater Level		
	Northing	Eastng			(m BTOC)	(m BGS)				(m BGS)	(m BTOC)	(m AMSL)
MW1	4811570	594989	1-Jun-15	5:04 PM	4.38	3.62	177.96	177.20	0.76	0.54	1.30	176.66
			24-Jun-15	9:56 AM						0.57	1.33	176.63
			2-Jul-15	10:34 AM						0.27	1.03	176.93
			13-Jul-15	10:28 AM						0.48	1.24	176.72
			2-Sep-15	9:46 AM						1.34	2.10	175.86
			23-Feb-16	12:13 PM						0.31	1.07	176.89
			18-Apr-16	9:23 AM						0.35	1.11	176.85
MW5	4811692	594802	1-Jun-15	3:06 PM	4.32	3.57	178.05	177.30	0.75	-	DRY	-
			24-Jun-15	10:40 AM						3.44	4.19	173.86
			2-Jul-15	11:10 AM						3.43	4.18	173.87
			13-Jul-15	10:52 AM						-	DRY	-
			3-Sep-15	12:19 PM						-	DRY	-
			23-Feb-16	12:50 PM						3.40	4.15	173.90
			18-Apr-16	11:29 AM						3.40	4.15	173.90
MW10	4812086	594715	1-Jun-15	4:25 PM	4.50	3.63	179.90	179.90	0.87	0.23	1.10	179.67
			24-Jun-15	9:46 AM						0.59	1.46	179.31
			2-Jul-15	10:23 AM						0.36	1.23	179.54
			13-Jul-15	10:16 AM						0.62	1.49	179.28
			2-Sep-15	10:07 AM						1.65	2.52	178.25
			23-Feb-16	12:13 PM						0.30	1.17	179.60
			18-Apr-16	9:48 AM						0.49	1.36	179.41
MW12	4812007	594572	1-Jun-15	1:38 PM	4.00	3.14	179.16	178.30	0.86	0.67	1.53	177.63
			24-Jun-15	10:30 AM						0.59	1.45	177.71
			2-Jul-15	11:00 AM						0.34	1.20	177.96
			13-Jul-15	10:43 AM						0.56	1.42	177.74
			2-Sep-15	11:45 AM						1.47	2.33	176.83
			23-Feb-16	1:07 PM						0.28	1.14	178.02
			18-Apr-16	11:47 AM						0.41	1.27	177.89
MW17	4812393	594418	1-Jun-15	3:50 PM	4.53	3.62	181.51	180.60	0.91	0.66	1.57	179.94
			24-Jun-15	9:03 AM						1.24	2.15	179.36
			2-Jul-15	10:12 AM						0.79	1.70	179.81
			13-Jul-15	9:55 AM						0.63	1.54	179.97
			2-Sep-15	10:23 AM						1.13	2.04	179.47
			23-Feb-16	12:44 PM						0.49	1.40	180.11
			18-Apr-16	9:54 AM						0.33	1.24	180.27
MW19	4811717	594754	1-Jun-15	3:13 PM	4.51	3.61	181.90	181.00	0.90	0.71	1.61	180.29
			24-Jun-15	8:57 AM						1.99	2.89	179.01
			2-Jul-15	10:02 AM						1.34	2.24	179.66
			13-Jul-15	10:06 AM						0.91	1.81	180.09
			2-Sep-15	10:33 AM						0.93	1.83	180.07
			23-Feb-16	12:52 PM						0.80	1.70	180.20
			18-Apr-16	10:16 AM						0.48	1.38	180.52

TABLE 1
GROUNDWATER LEVEL DATA - MONITORING WELLS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Well ID	UTM Coordinates		Date	Time	Well Depth		Top of Casing Elevation (m AMSL)	Ground Surface Elevation (m AMSL)	Pipe Stick-up (m)	Groundwater Level		
	Northing	Eastings			(m BTOC)	(m BGS)				(m BGS)	(m BTOC)	(m AMSL)
MW24	4812670	594050	1-Jun-15	10:31 AM	10.30	9.53	179.77	179.00	0.77	0.54	1.31	178.46
			23-Jun-15	3:30 PM						0.47	1.24	178.54
			2-Jul-15	8:32 AM						0.43	1.20	178.57
			13-Jul-15	11:23 AM						0.47	1.24	178.53
			3-Sep-15	10:12 AM						0.73	1.50	178.27
			23-Feb-16	11:30 AM						0.64	1.41	178.36
			19-Apr-16	9:46 AM						0.29	1.06	178.71
MW28	4812668	593934	2-Jun-15	10:10 AM	9.89	9.08	179.61	178.80	0.81	0.28	1.09	178.52
			23-Jun-15	4:12 PM						0.39	1.20	178.41
			2-Jul-15	8:38 AM						0.19	1.00	178.61
			13-Jul-15	11:28 AM						0.21	1.02	178.59
			3-Sep-15	10:04 AM						0.48	1.29	178.32
			23-Feb-16	10:35 AM						0.35	1.16	178.45
			19-Apr-16	12:05 PM						0.04	0.85	178.76
MW30	4812866	593916	2-Jun-15	12:59 PM	4.66	3.85	181.01	180.20	0.81	0.58	1.39	179.62
			23-Jun-15	3:40 PM						0.43	1.24	179.77
			2-Jul-15	8:44 AM						0.33	1.14	179.87
			13-Jul-15	11:33 AM						0.57	1.38	179.63
			3-Sep-15	9:52 AM						1.60	2.41	178.60
			23-Feb-16	10:50 AM						0.41	1.22	179.79
			19-Apr-16	10:29 AM						0.32	1.13	179.88
MW37	4813072	593570	2-Jun-15	11:43 AM	4.39	3.49	182.40	181.50	0.90	0.67	1.57	180.83
			23-Jun-15	3:52 PM						0.49	1.39	181.02
			2-Jul-15	8:52 AM						0.29	1.19	181.21
			13-Jul-15	11:42 AM						0.56	1.46	180.94
			3-Sep-15	9:34 AM						1.76	2.57	178.44
			23-Feb-16	11:07 AM						0.40	1.21	179.80
			19-Apr-16	10:57 AM						0.51	1.32	179.69
MW201	4811040	595305	19-Jun-15	10:55 AM	10.06	9.31	180.82	180.07	0.75	-	DRY	-
			23-Jun-15	12:25 PM						-	DRY	-
			2-Jul-15	11:30 AM						9.24	9.99	170.83
			13-Jul-15	12:38 PM						9.03	9.78	171.04
			2-Sep-15	12:31 PM						7.92	8.67	172.15
			23-Feb-16	12:18 PM						2.87	3.62	177.20
			18-Apr-16	12:47 PM						2.52	3.27	177.55
MW202	4811433	594721	19-Jun-15	1:53 PM	10.24	9.44	177.13	176.33	0.80	3.68	4.48	172.65
			23-Jun-15	11:56 AM						3.76	4.56	172.57
			2-Jul-15	12:53 PM						3.66	4.46	172.67
			13-Jul-15	2:40 PM						3.70	4.50	172.63
			2-Sep-15	2:51 PM						4.30	5.10	172.03
			23-Feb-16	2:44 PM						3.70	4.50	172.63
			20-Apr-16	11:00 AM						2.93	3.73	173.40

TABLE 1
GROUNDWATER LEVEL DATA - MONITORING WELLS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Well ID	UTM Coordinates		Date	Time	Well Depth		Top of Casing Elevation (m AMSL)	Ground Surface Elevation (m AMSL)	Pipe Stick-up (m)	Groundwater Level		
	Northing	Eastings			(m BTOC)	(m BGS)				(m BGS)	(m BTOC)	(m AMSL)
MW203	4811515	594650	19-Jun-15	2:46 PM	10.23	9.23	172.83	171.83	1.00	7.85	8.85	163.98
			23-Jun-15	11:40 AM						5.95	6.95	165.88
			2-Jul-15	1:38 PM						3.28	4.28	168.55
			13-Jul-15	2:31 PM						4.19	5.19	167.64
			2-Sep-15	12:48 PM						2.77	3.77	169.06
			23-Feb-16	2:12 PM						2.97	3.97	168.86
			20-Apr-16	11:44 AM						1.81	2.81	170.02
MW204	4811644	594556	19-Jun-15	3:10 PM	9.96	9.21	176.77	176.02	0.75	8.65	9.40	167.37
			23-Jun-15	11:20 AM						6.59	7.34	169.44
			2-Jul-15	2:08 PM						3.13	3.88	172.89
			13-Jul-15	2:10 PM						2.17	2.92	173.85
			2-Sep-15	8:51 AM						2.58	3.33	173.44
			23-Feb-16	1:39 PM						2.00	2.75	174.02
			20-Apr-16	9:57 AM						1.83	2.58	174.19
MW205	4811713	594423	16-Jun-15	1:00 PM	9.92	9.19	173.58	172.85	0.73	-	DRY	-
			23-Jun-15	10:05 AM						8.99	9.72	163.87
			2-Jul-15	2:20 PM						8.55	9.28	164.30
			13-Jul-15	9:09 AM						7.76	8.49	165.09
			2-Sep-15	9:18 AM						3.92	4.65	168.93
			23-Feb-16	8:47 AM						1.87	2.60	170.98
			19-Apr-16	3:04 PM						1.22	1.95	171.63
MW206	4811932	594290	16-Jun-15	12:50 PM	8.50	7.51	175.02	174.03	0.99	0.13	1.12	173.90
			23-Jun-15	9:24 AM						0.10	1.09	173.93
			2-Jul-15	2:53 PM						-0.53	0.46	174.56
			13-Jul-15	8:58 AM						-0.67	0.32	174.70
			2-Sep-15	8:25 AM						-0.65	0.34	174.68
			20-Apr-16	2:41 PM						-	Artesian	-
MW207	4812095	594213	16-Jun-15	12:42 PM	9.65	8.92	178.81	178.08	0.73	8.29	9.02	169.79
			23-Jun-15	8:26 AM						8.75	9.48	169.33
			2-Jul-15	3:22 PM						8.77	9.50	169.31
			13-Jul-15	8:52 AM						8.78	9.51	169.30
			2-Sep-15	8:14 AM						8.31	9.04	169.77
			23-Feb-16	9:15 AM						4.85	5.58	173.23
			20-Apr-16	8:20 AM						3.52	4.25	174.56
MW208	4811970	594006	16-Jun-15	1:15 PM	8.76	7.91	179.84	178.99	0.85	3.47	4.32	175.52
			23-Jun-15	10:53 AM						3.43	4.28	175.57
			2-Jul-15	1:47 PM						3.46	4.31	175.53
			13-Jul-15	2:50 PM						3.42	4.27	175.57
			2-Sep-15	3:00 PM						3.77	4.62	175.22
			23-Feb-16	9:36 AM						3.06	3.91	175.93
			20-Apr-16	9:35 AM						2.50	3.35	176.49

TABLE 1
GROUNDWATER LEVEL DATA - MONITORING WELLS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Well ID	UTM Coordinates		Date	Time	Well Depth		Top of Casing Elevation (m AMSL)	Ground Surface Elevation (m AMSL)	Pipe Stick-up (m)	Groundwater Level		
	Northing	Eastng			(m BTOC)	(m BGS)				(m BGS)	(m BTOC)	(m AMSL)
MW209	4812433	593818	19-Jun-15	12:15 PM	9.78	9.08	180.38	179.68	0.70	6.77	7.47	172.91
			23-Jun-15	3:05 PM						1.29	1.99	178.39
			2-Jul-15	8:15 AM						1.26	1.96	178.42
			13-Jul-15	11:17 AM						1.23	1.93	178.45
			3-Sep-15	10:29 AM						1.51	2.21	178.17
			19-Apr-16	9:30 AM						1.34	2.04	178.34
MW210	4812378	593757	19-Jun-15	4:56 PM	9.85	9.01	180.96	180.12	0.84	4.87	5.71	175.25
			23-Jun-15	5:18 PM						1.67	2.51	178.45
			2-Jul-15	9:29 AM						1.52	2.36	178.60
			13-Jul-15	12:20 PM						1.50	2.34	178.62
			3-Sep-15	8:20 AM						1.72	2.56	178.40
			23-Feb-16	9:50 AM						1.44	2.28	178.68
MW211	4812603	593727	19-Jun-15	10:35 AM	9.79	9.12	178.59	177.92	0.67	0.33	1.00	177.59
			23-Jun-15	4:22 PM						0.29	0.96	177.63
			2-Jul-15	9:02 AM						0.24	0.91	177.68
			13-Jul-15	11:54 AM						0.23	0.90	177.69
			3-Sep-15	9:01 AM						0.42	1.09	177.50
			23-Feb-16	10:30 AM						0.23	0.90	177.69
MW212	4812537	593602	29-Feb-16	8:30 AM	9.79	9.05	179.70	178.96	0.74	0.20	0.87	177.72
			19-Apr-16	12:45 PM						0.09	0.76	177.83
			16-Jun-15	12:00 PM						-	DRY	-
			23-Jun-15	4:55 PM						-	DRY	-
			2-Jul-15	9:20 AM						-	DRY	-
			13-Jul-15	11:58 AM						-	DRY	-
MW213	4813423	593177	3-Sep-15	8:36 AM	10.01	9.21	183.27	182.47	0.80	-	DRY	-
			23-Feb-16	10:30 AM						6.10	6.84	172.86
			19-Apr-16	1:22 PM						4.58	5.32	174.38
			17-Jun-15	4:20 PM						-	DRY	-
			24-Jun-15	11:33 AM						8.09	8.89	174.38
			2-Jul-15	4:20 PM						5.76	6.56	176.71
MW214	4813752	593293	13-Jul-15	1:34 PM	12.70	11.85	185.15	184.30	0.85	2.79	3.59	179.68
			2-Sep-15	2:13 PM						1.65	2.45	180.82
			23-Feb-16	3:30 PM						1.40	2.20	181.07
			22-Apr-16	7:00 AM						1.16	1.96	181.31
			16-Jun-15	5:15 PM						0.44	1.29	183.86
			24-Jun-15	12:30 PM						0.56	1.41	183.74
MW214	4813752	593293	2-Jul-15	4:48 PM	12.70	11.85	185.15	184.30	0.85	8.42	9.27	175.88
			13-Jul-15	1:58 PM						8.37	9.22	175.93
			2-Sep-15	2:32 PM						8.47	9.32	175.83
			23-Feb-16	3:30 PM						6.83	7.68	177.47
			18-Apr-16	7:00 AM						5.38	6.23	178.92

TABLE 2
GROUNDWATER LEVEL DATA - DRIVE-POINT PIEZOMETERS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Piezometer ID	UTM Coordinates		Constructed Depth		Screen Length	Screen Separation ⁽¹⁾	Pipe Stick-up	Top of Casing Elevation	Ground Surface Elevation ⁽²⁾	Date	Time	Groundwater Level			Surface Water Level			Vertical Hydraulic Gradient
	Northing	Easting	(m BTOC)	(m BGS)	(m)	(m)	(m)	(m AMSL)	(m AMSL)	(m BGS) ⁽³⁾	(m BTOC)	(m AMSL)	(m BGS) ⁽⁴⁾	(m BTOC)	(m AMSL)	(+) = Upward (-) = Downward		
DP1-15	4811906	594083	1.64	0.69	0.42	0.48	0.95	173.61	172.66	19-Jun-15	3:54 PM	-	DRY	-	-	0.84	172.77	-
										23-Jun-15	2:42 PM	0.32	1.27	172.34	-0.09	0.86	172.75	-0.86
										3-Jul-15	9:20 AM	-	DRY	-	-0.12	0.83	172.78	-
										13-Jul-15	2:56 PM	-	DRY	-	-0.06	0.89	172.72	-
										2-Sep-15	3:10 PM	0.05	1.00	172.61	-0.02	0.93	172.68	-0.15
										23-Feb-16	9:24 AM	-	FROZEN	-	-	FROZEN	-	-
										29-Feb-16	10:34 AM	-0.59	0.36	173.25	-0.59	0.36	173.25	0.00
										20-Apr-16	8:50 AM	-0.21	0.74	172.87	-0.17	0.78	172.83	0.08
DP2-15	4811729	594379	2.55	1.39	0.42	1.18	1.16	172.88	171.72	19-Jun-15	8:49 AM	0.73	1.89	170.99	-0.04	1.12	171.76	-0.65
										24-Jun-15	10:28 AM	0.72	1.88	171.00	0.00	1.16	171.72	-0.61
										3-Jul-15	8:40 AM	-	DRY	-	-0.06	1.10	171.78	-
										13-Jul-15	9:10 AM	0.63	1.79	171.09	-	DRY	-	-
										2-Sep-15	9:23 AM	0.68	1.84	171.04	-	DRY	-	-
										23-Feb-16	8:56 AM	0.47	1.63	171.25	-	FROZEN	-	-
										29-Feb-16	10:20 AM	0.45	1.61	171.27	-0.59	0.57	172.31	-0.88
										20-Apr-16	10:21 AM	0.30	1.46	171.42	-0.05	1.11	171.77	-0.30
DP3-15	4811672	594486	2.55	1.29	0.42	1.26	1.26	172.66	171.40	19-Jun-15	3:33 PM	0.58	1.84	170.82	-0.07	1.19	171.47	-0.52
										23-Jun-15	2:15 PM	0.49	1.75	170.91	-0.03	1.23	171.43	-0.41
										3-Jul-15	8:50 AM	0.52	1.78	170.88	-0.09	1.17	171.49	-0.48
										13-Jul-15	2:13 PM	0.50	1.76	170.90	0.00	1.26	171.40	-0.40
							0.04	171.44		2-Sep-15	9:00 AM	0.47	1.73	170.93	-	DRY	-	-
										23-Feb-16	8:56 AM	-	FROZEN	-	-	FROZEN	-	-
										29-Feb-16	9:14 AM	-	-	-	-0.33	-0.29	171.73	-
										20-Apr-16	10:09 AM	-1.25	0.01	172.65	-1.06	0.20	172.46	0.15
DP4-15	4811451	594589	2.55	1.21	0.42	1.00	1.34	171.12	169.78	19-Jun-15	2:55 PM	0.72	2.06	169.06	-0.21	1.13	169.99	-0.93
										23-Jun-15	1:35 PM	0.74	2.08	169.04	-0.18	1.16	169.96	-0.92
										3-Jul-15	10:32 AM	-	DRY	-	-0.24	1.10	170.02	-
										13-Jul-15	2:33 PM	0.61	1.95	169.17	-0.16	1.18	169.94	-0.77
										2-Sep-15	12:58 PM	0.48	1.82	169.30	-0.11	1.23	169.89	-0.59
										23-Feb-16	2:11 PM	0.18	1.52	169.60	-0.38	0.96	170.16	-0.56
										22-Apr-16	7:16 AM	0.08	1.42	169.70	-0.24	1.10	170.02	-0.32
DP5-15	4811717	594754	2.55	1.36	0.42	1.15	1.19	171.85	170.66	19-Jun-15	1:21 PM	0.85	2.04	169.81	-0.18	1.01	170.84	-0.89
										24-Jun-15	10:55 AM	0.71	1.90	169.95	-0.13	1.06	170.79	-0.73
										3-Jul-15	10:14 AM	0.68	1.87	169.98	-0.23	0.96	170.89	-0.79
										13-Jul-15	11:04 AM	0.52	1.71	170.14	-0.11	1.08	170.77	-0.55
										2-Sep-15	11:27 AM	0.41	1.60	170.25	-0.05	1.14	170.71	-0.40
										23-Feb-16	12:41 PM	-0.13	1.06	170.79	-0.31	0.88	170.97	-0.16
										29-Feb-16	9:50 AM	0.08	1.27	170.58	-0.61	0.58	171.27	-0.60
										18-Apr-16	12:39 PM	-0.02	1.17	170.68	-0.25	0.94	170.91	-0.20

TABLE 2
GROUNDWATER LEVEL DATA - DRIVE-POINT PIEZOMETERS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Piezometer ID	UTM Coordinates		Constructed Depth		Screen Length	Screen Separation ⁽¹⁾	Pipe Stick-up	Top of Casing Elevation	Ground Surface Elevation ⁽²⁾	Date	Time	Groundwater Level			Surface Water Level			Vertical Hydraulic Gradient (+) = Upward (-) = Downward
	Northing	Easting	(m BTOC)	(m BGS)	(m)	(m)	(m)	(m AMSL)	(m AMSL)			(m BGS) ⁽³⁾	(m BTOC)	(m AMSL)	(m BGS) ⁽⁴⁾	(m BTOC)	(m AMSL)	
DP6-15	4812491	593568	2.55	1.23	0.42	1.02	1.32	177.60	176.28	19-Jun-15	4:48 PM	0.42	1.74	175.86	-0.24	1.08	176.52	-0.64
										23-Jun-15	5:05 PM	0.41	1.73	175.87	-0.23	1.09	176.51	-0.63
										3-Jul-15	9:40 AM	0.40	1.72	175.88	-0.25	1.07	176.53	-0.64
										13-Jul-15	12:05 PM	0.40	1.72	175.88	-0.22	1.10	176.50	-0.61
										2-Sep-15	8:43 AM	0.40	1.72	175.88	-0.13	1.19	176.41	-0.52
										23-Feb-16	8:56 AM	-	FROZEN	-	-	FROZEN	-	-
										29-Feb-16	9:50 AM	-	FROZEN	-	-0.74	0.58	177.02	-

Notes:
(1) Distance between watercourse substrate and mid-point of piezometer screen.
(2) Ground surface represents the watercourse substrate.
(3) A negative value indicates that the measured water level in pipe is above ground surface.
(4) A negative value indicates that the surface water level is above ground surface
m BGS = meters below ground surface
m BTOC = meters below top of casing
DRY = groundwater/surface water was not observed in the piezometer/watercourse, respectively
- = data not available

TABLE 3
GROUNDWATER QUALITY RESULTS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Sample Location			MW1		MW10		MW12		MW17		MW19		MW24		MW28		MW30		MW37		MW201	
Sample Date			4-Jun-15	19-Apr-16	4-Jun-15	18-Apr-16	4-Jun-15	18-Apr-16	4-Jun-15	18-Apr-16	4-Jun-15	18-Apr-16	4-Jun-15	19-Apr-16	4-Jun-15	19-Apr-16	4-Jun-15	19-Apr-16	4-Jun-15	19-Apr-16	19-Apr-16	19-Apr-16
Sample ID			WG-160960844-20150604-NS08	WG 160960844-20160419-NS14	WG-160960844-20150604-NS05	WG160960844-20160418-NS04	WG-160960844-20150604-NS09	WG160960844-20160418-NS05	WG-160960844-20150604-NS07	WG160960844-20160418-NS02	WG-160960844-20150604-NS06	WG160960844-20160418-NS03	WG-160960844-20150604-NS01	WG 160960844-20160419-NS08	WG-160960844-20150604-NS02	WG 160960844-20160419-NS12	WG-160960844-20150604-NS04	WG 160960844-20160419-NS09	WG-160960844-20150604-NS03	WG 160960844-20160419-NS10	WG 160960844-20160419-NS11	WG 160960844-20160419-NS15
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B5A6976	B677799	B5A6976	B676695	B5A6976	B676695	B5A6976	B676695	B5A6976	B676695	B5A6976	B677799	B5A6976	B677799	B5A6976	B677799	B5A6976	B677799	B677799	B677799
Laboratory Sample ID			AJY606	CFG893	AJY603	CFB909	AKC297	CFB910	AJY605	CFB907	AJY604	CFB908	AJY599	CFG887	AJY600	CFG891	AJY602	CFG888	AJY601	CFG889	CFG890	CFG894
Sample Type	Units	ODWS																			Field Duplicate	
General Chemistry																						
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	560	510	490	490	440	400	670	680	470	490	120	110	100	99	470	440	680	640	640	420
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	4.5	6.9	4.0	3.3	2.7	5.0	5.5	5.3	3.6	3.2	1.1	1.0	<1.0	<1.0	3.3	4.5	6.4	8.8	9.8	6.7
Alkalinity, Total (as CaCO3)	mg/L	30-500 ^F	570 ^E	520 ^E	490	500	440	410	680 ^E	690 ^E	470	490	120	110	100	99	470	440	690 ^E	650 ^E	650 ^E	430
Ammonia (as N)	mg/L	n/v	0.077	<0.050	0.10	<0.050	<0.050	<0.050	0.29	0.10	0.12	0.088	0.35	0.24	0.45	0.30	0.16	<0.050	0.15	<0.050	<0.050	0.33
Anion Sum	meq/L	n/v	21.1	18.9	17.6	18.5	11.3	10.9	24.0	24.3	50.0	52.0	8.53	8.57	11.6	11.0	43.4	44.6	26.9	25.3	25.0	17.0
Cation Sum	meq/L	n/v	21.0	21.2	19.1	20.3	11.3	11.5	26.6	28.5	48.7	53.9	8.23	8.92	12.1	12.1	44.6	48.6	28.3	27.1	26.8	17.6
Chloride	mg/L	250 ^C	13	13	14	15	8	8.5	15	13	38	34	140	140	230	210	130	120	49	44	44	8.8
Dissolved Organic Carbon (DOC)	mg/L	5 ^C	2.8	2.6	2.8	2.1	1.6	2.0	5.1 ^C	4.2	6.7 ^C	5.4 ^C	1.3	0.36	1.7	0.83	5.7 ^C	3.7	4.1	4.0	3.8	2.2
Electrical Conductivity, Lab	µmhos/cm	n/v	1800	1600	1500	1600	990	950	2000	1900	3800	3700	940	940	1300	1300	3400	3400	2200	2100	2100	1400
Hardness (as CaCO3)	mg/L	80-100 ^F	870 ^E	870 ^E	790 ^E	850 ^E	510 ^E	510 ^E	1100 ^E	1200 ^E	2000 ^E	2200 ^E	190 ^E	210 ^E	280 ^E	270 ^E	1800 ^E	2000 ^E	1100 ^E	1100 ^E	1100 ^E	760 ^E
Ion Balance	%	n/v	0.120	5.66	4.15	4.59	0.310	3.01	5.11	8.08	1.29	1.83	1.78	2.01	2.01	4.79	1.34	4.34	2.51	3.58	3.54	1.88
Langelier Index (at 20 C)	none	n/v	1.02	1.23	1.22	1.13	0.954	1.23	1.21	1.16	1.16	1.12	0.249	0.224	0.237	0.0850	1.16	1.34	1.15	1.30	1.34	1.15
Langelier Index (at 4 C)	none	n/v	0.773	0.984	0.971	0.883	0.706	0.985	0.962	0.914	0.914	0.874	0.00100	-0.0230	-0.0100	-0.162	0.918	1.10	0.908	1.05	1.10	0.899
Nitrate (as N)	mg/L	10.0 _d ^B	7.65	6.67	3.26	2.63	0.65	0.88	0.77	1.49	2.17	2.27	<0.10	<0.10	<0.10	<0.10	0.67	1.28	1.06	1.71	1.67	<0.10
Nitrate + Nitrite (as N)	mg/L	10.0 _d ^B	7.67	6.67	3.26	2.63	0.66	0.88	0.79	1.50	2.18	2.28	<0.10	<0.10	<0.10	<0.10	0.69	1.28	1.06	1.71	1.67	<0.10
Nitrite (as N)	mg/L	1.0 _d ^B	0.016	<0.010	<0.010	<0.010	0.011	<0.010	0.024	0.010	0.015	0.011	<0.010	<0.010	<0.010	<0.010	0.019	<0.010	<0.010	<0.010	<0.010	<0.010
Orthophosphate(as P)	mg/L	n/v	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	S.U.	6.5-8.5 ^E	7.93	8.15	7.94	7.85	7.81	8.12	7.94	7.92	7.91	7.84	8.02	7.99	7.94	7.79	7.87	8.03	8.00	8.16	8.21	8.23
Saturation pH (at 20 C)	none	n/v	6.91	6.92	6.72	6.72	6.86	6.89	6.74	6.76	6.75	6.73	7.77	7.76	7.70	7.71	6.71	6.69	6.85	6.87	6.87	7.08
Saturation pH (at 4 C)	none	n/v	7.16	7.17	6.97	6.97	7.11	7.14	6.98	7.01	7.00	6.97	8.02	8.01	7.95	7.95	6.95	6.93	7.09	7.11	7.12	7.33
Sulfate	mg/L	500 _d ^C	420	370	340	390	100	110	480	480	1900 ^C	2000 ^C	110	110	150	150	1500 ^C	1500 ^C	560 ^C	530 ^C	510 ^C	390
Total Dissolved Solids (Calculated)	mg/L	500 ^C	1200 ^C	1100 ^C	1000 ^C	1100 ^C	580 ^C	580 ^C	1300 ^C	1400 ^C	3000 ^C	3200 ^C	490	510 ^C	690 ^C	680 ^C	2600 ^C	2700 ^C	1500 ^C	1400 ^C	1400 ^C	940 ^C
Metals																						
Aluminum	mg/L	0.1 ^E	0.011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.019	0.0062	<0.0050	0.0060	0.012	<0.0050	0.0084	0.0083	0.0092	0.0071	0.0053	<0.0050	<0.0050	0.0053
Antimony	mg/L	0.006 ^A	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00077
Arsenic	mg/L	0.025 ^A	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0063	0.013	0.0053	0.0091	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0015
Barium	mg/L	1 ^B	0.068	0.055	0.080	0.068	0.13	0.11	0.086	0.082	0.065	0.049	0.025	0.024	0.059	0.044	0.073	0.061	0.087	0.081	0.081	0.038
Beryllium	mg/L	n/v	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050					

TABLE 3
GROUNDWATER QUALITY RESULTS
CANADIAN NATIONAL RAILWAY
MILTON LOGISTICS HUB

Sample Location			MW202		MW204	MW205	MW206		MW208	MW209		MW210		MW211		MW214	
Sample Date			2-Jul-15	20-Apr-16	20-Apr-16	19-Apr-16	2-Jul-15	20-Apr-16	3-Jul-15	3-Jul-15	19-Apr-16	3-Jul-15	19-Apr-16	3-Jul-15	19-Apr-16	2-Jul-15	18-Apr-16
Sample ID			WG-1600960844-20150702-AD01	WG160960844-20160420-NS19	WG160960844-20160420-NS18	WG 160960844-20160419-NS16	WG-1600960844-20150702-AD02	WG160960844-20160420-NS17	WG-1600960844-20150703-AD05	WG-1600960844-20150703-AD06	WG 160960844-20160419-NS07	WG-1600960844-20150703-AD04	WG 160960844-20160419-NS06	WG-1600960844-20150703-AD07	WG 160960844-20160419-NS13	WG-1600960844-20150702-AD03	WG160960844-20160418-NS01
Sampling Company			STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory			MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX	MAXX
Laboratory Work Order			B5C9274	B678894	B678894	B677799	B5C9274	B678894	B5C9274	B5C9274	B677799	B5C9274	B677799	B5C9274	B677799	B5C9274	B676695
Laboratory Sample ID			AOE458	CFM172	CFM171	CFG895	AOE459	CFM170	AOE462	AOE463	CFG886	AOE461	CFG885	AOE464	CFG892	AOE460	CFB906
Sample Type			Units	ODWS													
General Chemistry																	
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	300	380	260	73	56	69	340	290	270	150	250	77	77	110	110
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	3.0	5.4	3.7	<1.0	<1.0	<1.0	2.6	1.9	2.7	<1.0	2.1	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	30-500 ^E	310	380	270	74	56	69	340	290	270	150	250	78	77	110	110
Ammonia (as N)	mg/L	n/v	0.61	0.46	0.28	0.21	0.59	0.59	0.60	0.55	0.30	0.62	0.44	0.83	0.62	0.49	0.42
Anion Sum	meq/L	n/v	16.2	19.4	15.4	31.7	25.3	26.6	14.5	29.5	28.3	42.4	50.5	14.9	14.8	15.8	17.6
Cation Sum	meq/L	n/v	17.0	20.5	15.7	35.4	27.3	28.6	15.4	28.9	29.8	44.4	52.8	15.2	16.1	17.1	19.7
Chloride	mg/L	250 ^C	41	30	140	560 ^C	430 ^C	430 ^C	190	120	130	170	150	260 ^C	250	140	140
Dissolved Organic Carbon (DOC)	mg/L	5 ^C	1.5	1.4	1.2	1.5	2.5	2.1	5.9 ^C	1.2	1.2	1.1	0.94	0.26	0.52	1.3	1.2
Electrical Conductivity, Lab	µmhos/cm	n/v	1500	1700	1500	3300	2700	2700	1500	2400	2400	3500	3800	1600	1600	1600	1700
Hardness (as CaCO3)	mg/L	80-100 ^E	590 ^E	780 ^E	440 ^E	840 ^E	700 ^E	740 ^E	630 ^E	1000 ^E	1100 ^E	1700 ^E	2100 ^E	310 ^E	330 ^E	570 ^E	660 ^E
Ion Balance	%	n/v	2.31	2.76	1.17	5.51	3.85	3.69	2.90	0.990	2.63	2.31	2.20	0.880	4.24	4.07	5.61
Langelier Index (at 20 C)	none	n/v	0.799	1.08	0.857	0.00500	-0.585	-0.0750	0.818	0.853	1.02	0.539	1.14	-0.0990	-0.0590	0.224	0.340
Langelier Index (at 4 C)	none	n/v	0.553	0.830	0.611	-0.238	-0.829	-0.319	0.572	0.609	0.779	0.297	0.895	-0.345	-0.305	-0.0220	0.0950
Nitrate (as N)	mg/L	10.0 _d ^B	<0.10	<0.10	<0.10	0.29	<0.10	<0.10	<0.10	<0.10	0.13	<0.10	<0.10	<0.10	0.26	<0.10	<0.10
Nitrate + Nitrite (as N)	mg/L	10.0 _d ^B	<0.10	<0.10	0.18	0.31	<0.10	<0.10	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	0.30	<0.10	<0.10
Nitrite (as N)	mg/L	1.0 _d ^B	<0.010	<0.010	0.177	0.015	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	0.039	<0.010	<0.010
Orthophosphate(as P)	mg/L	n/v	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	S.U.	6.5-8.5 ^E	8.03	8.19	8.18	7.48	7.05	7.46	7.91	7.84	8.03	7.59	7.95	7.69	7.70	7.72	7.83
Saturation pH (at 20 C)	none	n/v	7.23	7.11	7.32	7.48	7.64	7.54	7.10	6.99	7.00	7.05	6.81	7.79	7.76	7.50	7.50
Saturation pH (at 4 C)	none	n/v	7.48	7.36	7.56	7.72	7.88	7.78	7.34	7.24	7.25	7.29	7.05	8.04	8.01	7.74	7.74
Sulfate	mg/L	500 _e ^C	430	530 ^C	300	700 ^C	580 ^C	630 ^C	110	970 ^C	930 ^C	1700 ^C	2000 ^C	290	300	460	550 ^C
Total Dissolved Solids (Calculated)	mg/L	500 ^C	970 ^C	1100 ^C	900 ^C	2000 ^C	1600 ^C	1700 ^C	780 ^C	1800 ^C	1800 ^C	2700 ^C	3200 ^C	920 ^C	940 ^C	990 ^C	1100 ^C
Metals																	
Aluminum	mg/L	0.1 ^E	0.0091	<0.0050	<0.0050	0.0064	0.0099	0.015	<0.0050	<0.0050	<0.0050	0.0070	0.0055	0.0088	0.0075	0.0080	0.029
Antimony	mg/L	0.006 ^A	0.00096	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.0010	<0.00050
Arsenic	mg/L	0.025 ^A	0.0017	0.0051	0.0025	0.0016	0.0010	0.0021	<0.0010	0.0070	0.0074	0.0033	0.0073	0.0069	0.0069	0.0018	0.0047
Barium	mg/L	1 ^B	0.051	0.041	0.048	0.035	0.19	0.11	0.064	0.022	0.021	0.051	0.026	0.024	0.028	0.032	0.023
Beryllium	mg/L	n/v	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron	mg/L	5 ^A	0.78	0.76	0.79	1.7	1.9	2.0	0.66	1.5	1.4	1.7	1.6	2.3	2.1	1.1	1.2
Cadmium	mg/L	0.005 ^B	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium	mg/L	n/v	68	75	62	200	170	180	78	150	150	290	330	73	78	99	100
Chromium	mg/L	0.05 ^B	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt	mg/L	n/v	<0.00050	<0.00050	0.00060	<0.00050	0.0010	0.0017	<0.00050	0.00051	0.00060	0.0018	0.0031	<0.00050	<0.00050	0.00060	<0.00050
Copper	mg/L	1 ^C	0.0019	<0.0010	<0.0010	<0.0020	0.0018	0.0014	0.0013	<0.0010	<0.0010	0.0016	<0.0010	0.0010	<0.0010	0.0015	0.0014
Iron	mg/L	0.3 ^C	0.16	1.1 ^C	0.11	<0.10	<0.10	<0.10	0.18	0.15	0.23	<0.10	0.76 ^C	<0.10	<0.10	<0.10	0.14
Lead	mg/L	0.01 _e ^B	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium	mg/L	n/v	100	140	70	81	68	72	110	160	170	230	300	31	33	77	98
Manganese	mg/L	0.05 ^C	0.095 ^C	0.10 ^C	0.079 ^C	0.13 ^C	0.21 ^C	0.35 ^C	0.18 ^C	0.10 ^C	0.11 ^C	0.30 ^C	0.37 ^C	0.069 ^C	0.049	0.090 ^C	0.13 ^C
Molybdenum	mg/L	n/v	0.024	0.025	0.034	0.061	0.018	0.022	0.0075	0.0083	0.012	0.015	0.0080	0.027	0.035	0.038	0.042
Nickel	mg/L	n/v	0.0019	0.0027	0.0036	0.0069	0.0013	<0.0010	0.0014	0.0015	0.0013	0.0018	<0.0020 MI	<0.0010	<0.0010	0.0017	0.0014
Phosphorus	mg/L	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Potassium	mg/L	n/v	36	17	18	15	13	12	14	16	14	21	19	10	12	13	8.6
Selenium	mg/L	0.01 ^B	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon	mg/L	n/v	3.9	6.1	4.7	3.9	3.7	3.7	7.2	6.5	6.8	5.0	6.6	4.0	4.3	4.0	5.0
Silver	mg/L	n/v	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	mg/L	200 _g ^C 20 _g ^D	98 ^D	100 ^D	150 ^D	420 ^{CD}	300 ^{CD}	310 ^{CD}	56 ^D	170 ^D	180 ^D	230 ^{CD}	250 ^{CD}	200 ^D	210 ^{CD}	130 ^D	140 ^D
Strontium	mg/L	n/v	3.8	5.0	6.4	16	14	15	7.5	12	11	11	11	12	11	7.1	8.6
Thallium	mg/L	n/v	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000051	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Titanium	mg/L	n/v	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Uranium	mg/L	0.02 ^B	0.0032	0.0024	0.0012	0.0030	0.0018	0.0040	0.00033	0.0011	0.0011	0.0026	0.0013	0.00033	0.00054	0.0021	0.00063
Vanadium	mg/L	n/v	0.00074	<0.00050	<0.00050	0.00057	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00060	<0.00050	<0.00050
Zinc	mg/L	5 ^C	0.0075	<0.0050	0.013	0.0062	0.0092	0.036	0.0062	<0.010 MI	<0.010 MI	<0.025 MI	<0.025 MI	0.0090	0.0050	0.0065	0.0087

See notes on last page

Notes:

ODWS Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines (MOE, 2006)

^A ODWS Table 2 - Chemical Standards, Interim Maximum Acceptable Concentration

^B ODWS Table 2 - Chemical Standards, Maximum Acceptable Concentration

^C ODWS Table 4 - Chemical/Physical Objectives and Guidelines, Aesthetic Objectives

^D ODWS Table 4 - Medical Officer of Health Reporting Limit

^E ODWS Table 4 - Chemical/Physical Objectives and Guidelines, Operational Guidelines

6.5^A Concentration exceeds the indicated standard.

15.2 Measured concentration did not exceed the indicated standard.

<0.50 Laboratory reporting limit was greater than the applicable standard.

<0.03 Analyte not detected at a concentration greater than the laboratory reporting limit.

n/v No standard/guideline value.

- Parameter not analyzed / not available.

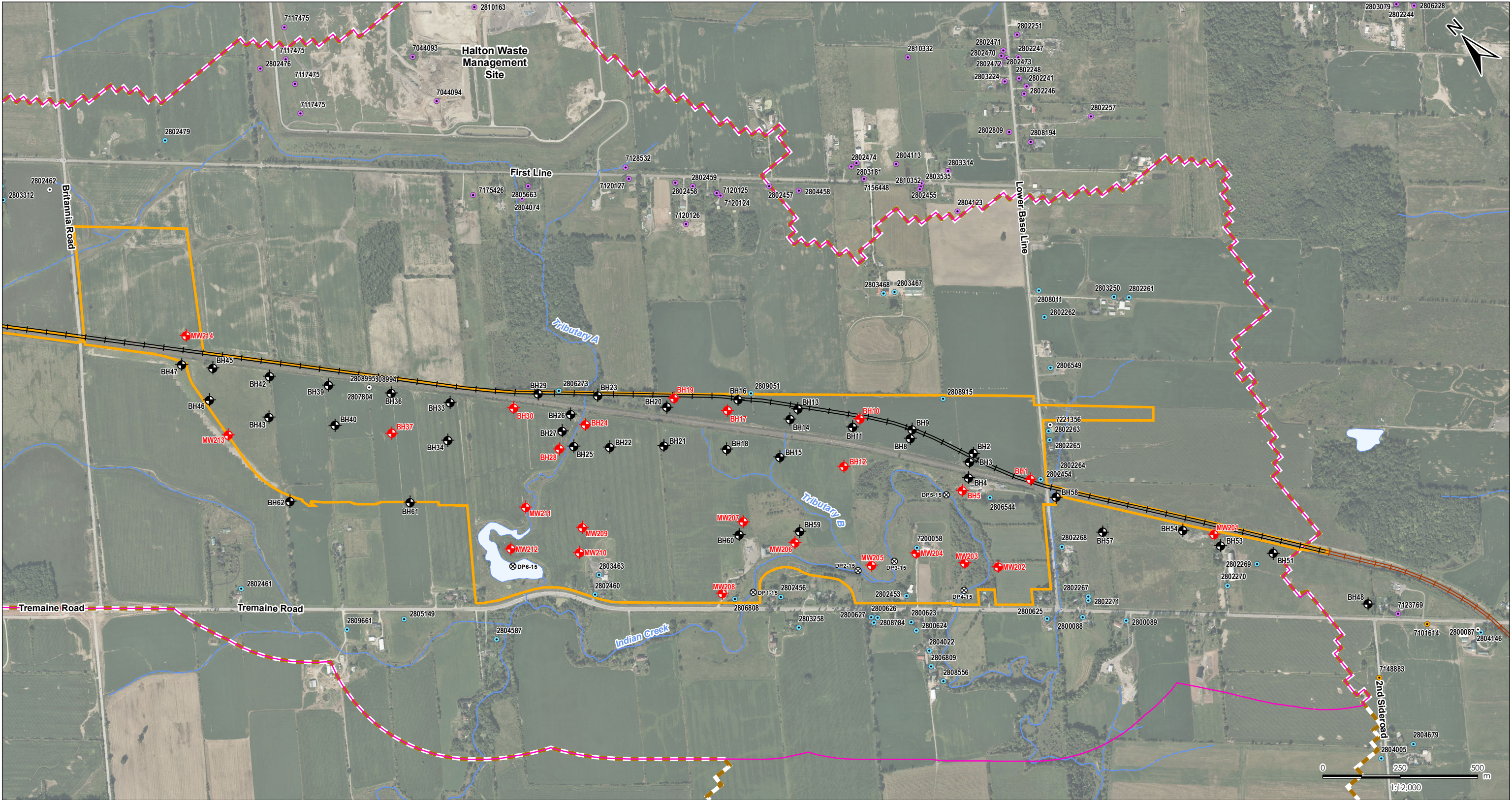
^c This standard applies to water at the point of consumption. Since lead is a component in some plumbing systems, first flush water may contain higher concentrations of lead than water that has been flushed for five minutes.

^d Where both nitrate and nitrite are present, the total of the two should not exceed 10 mg/L (as nitrogen).

^g ^{CD} The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets

Attachment B - Figures

\\Cd1220102\01_609\active\60960844\drawing\MXD\Hydrogeology\Report_Figures\CEAA_Response\160960844_CEEA_FigIR15_1_GWMonLoc.mxd
Revised: 2016-05-17 By: p.worsell



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, 2016. Site layout: July 10, 2015.
3. Orthoimagery © First Base Solutions, 2016. Imagery taken in 2014.
4. MOECC water well locations are approximate and have been positioned based on published UTM coordinates.

Legend

Project Components

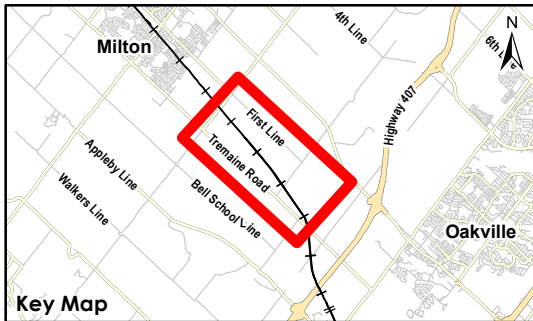
- Project Development Area
- Local Assessment Area
- Regional Assessment Area
- Existing Double Track Mainline
- Double Track - Mainline

Existing Features

- Permanent Stream
- Intermittent Stream
- Waterbody
- Borehole with Monitoring Well
- Borehole
- Drive-Point Piezometer

MOECC Water Wells (January 2015)

- Abandoned
- Water Supply
- Observation Well/Test Hole
- Unknown



Client/Project

Canadian National Railway
Milton Logistics Hub

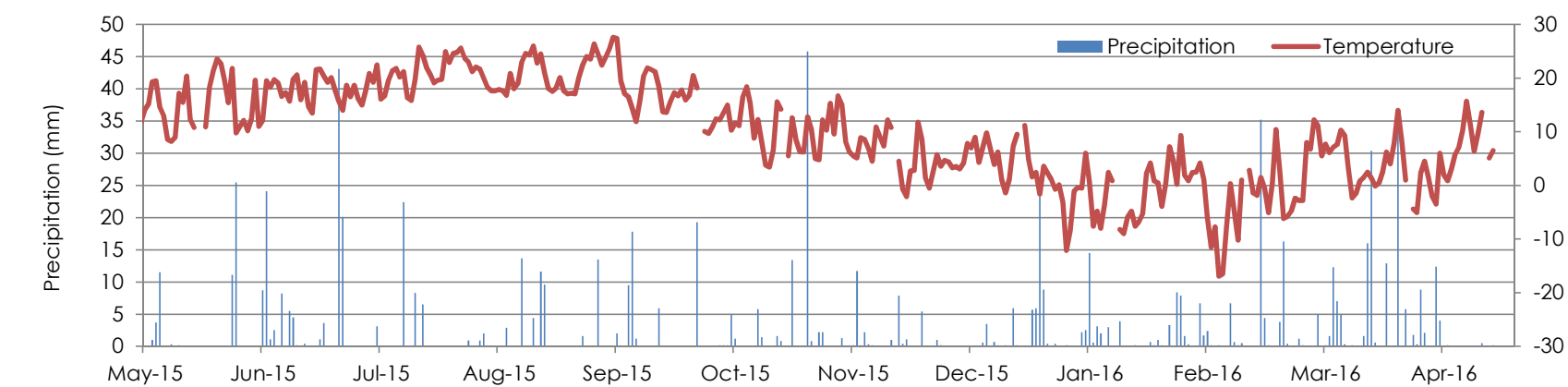
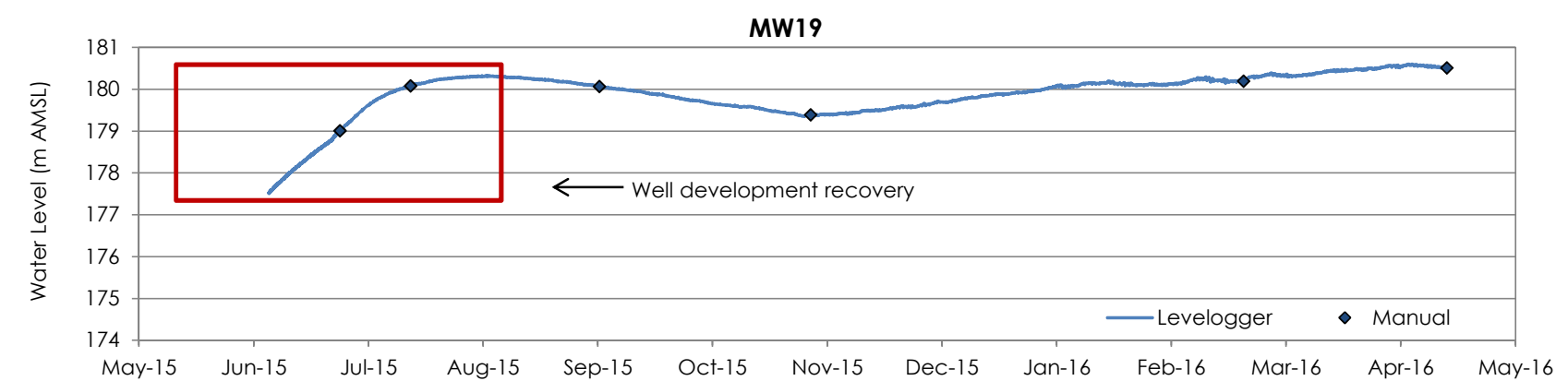
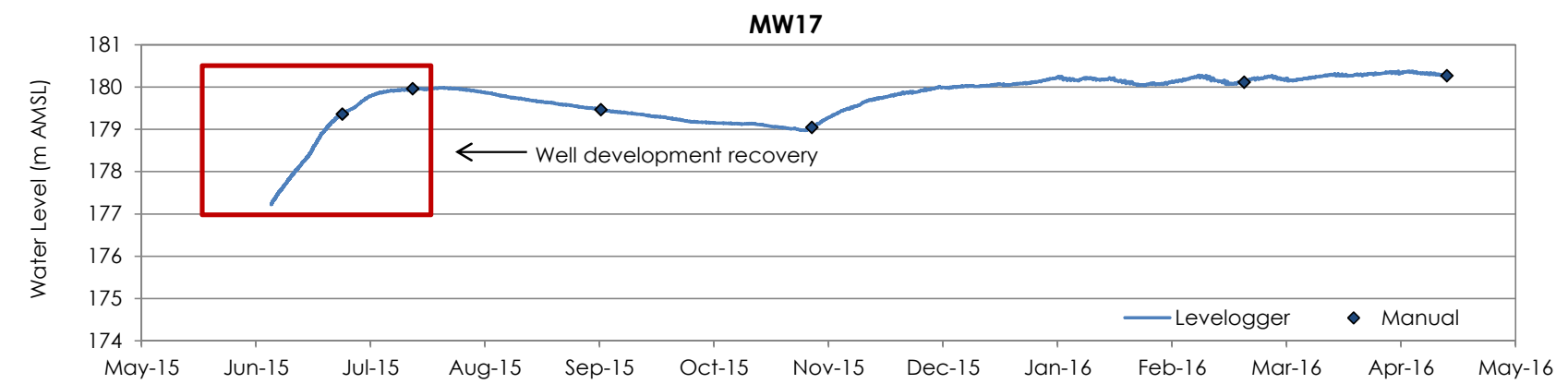
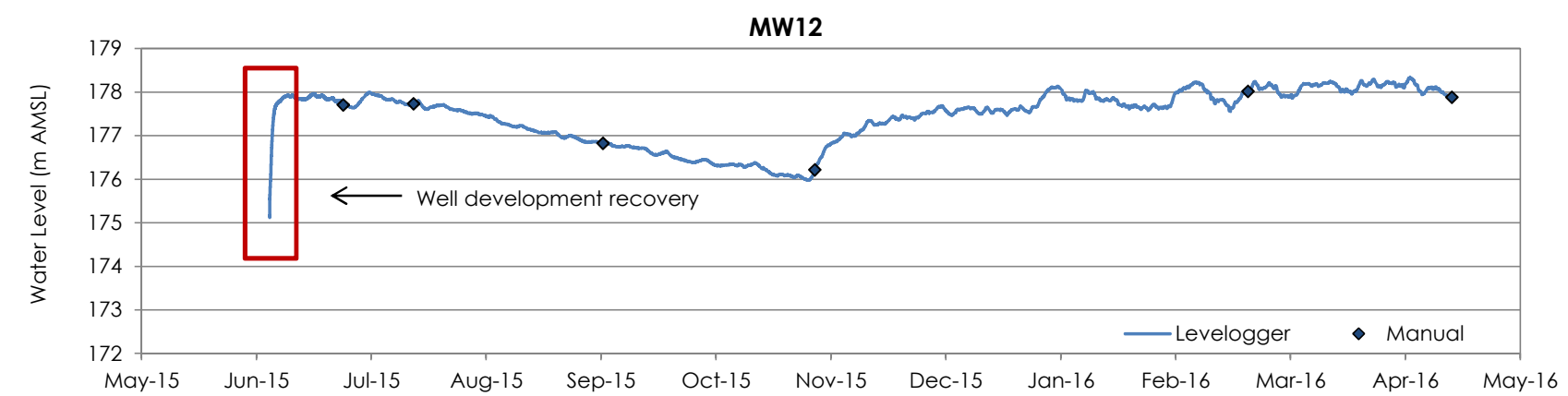
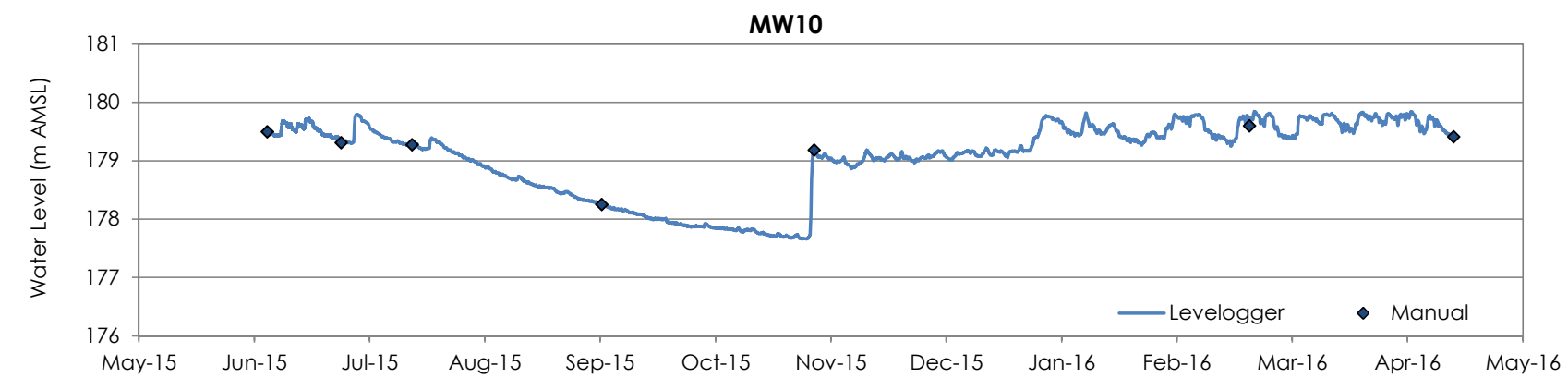
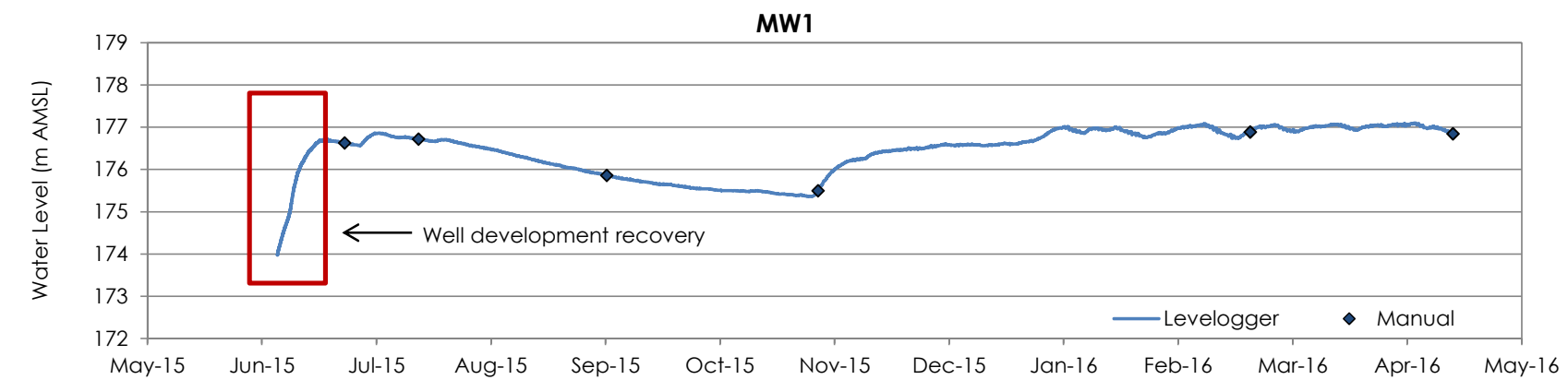
Figure No.

IR# 15-1

Title

**Groundwater Monitoring Locations
and MOECC Water Wells**

May 2016
160960844



Notes:

Client/Project

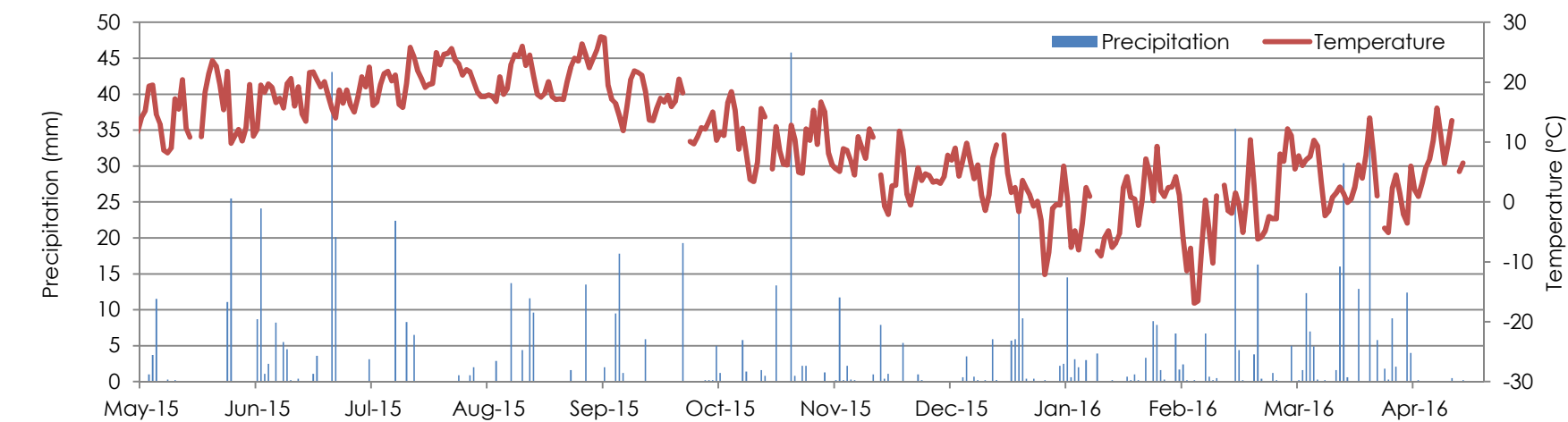
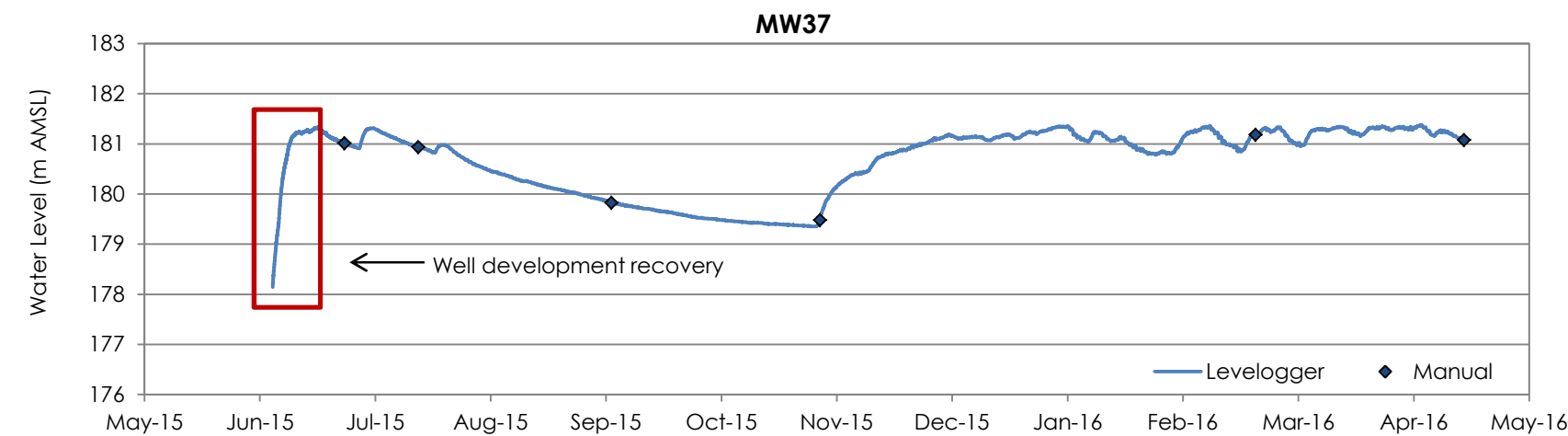
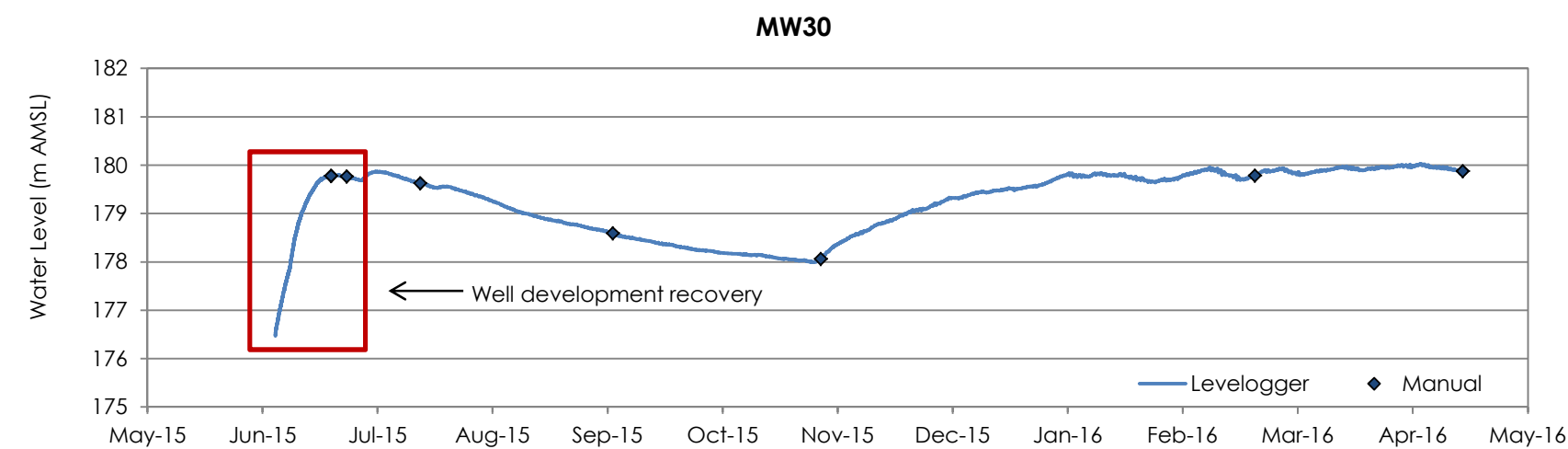
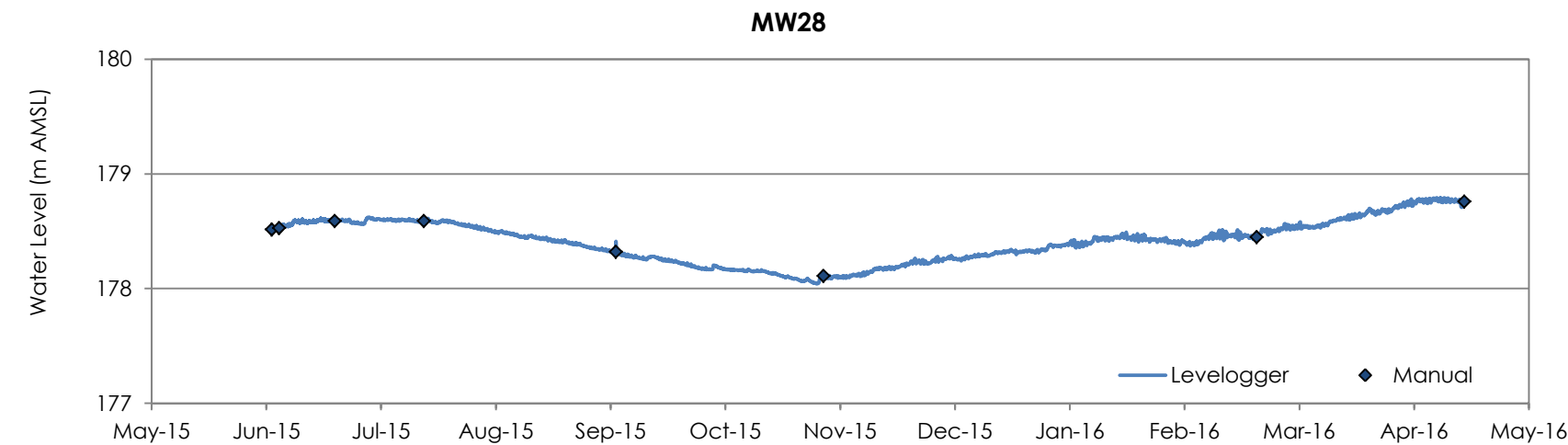
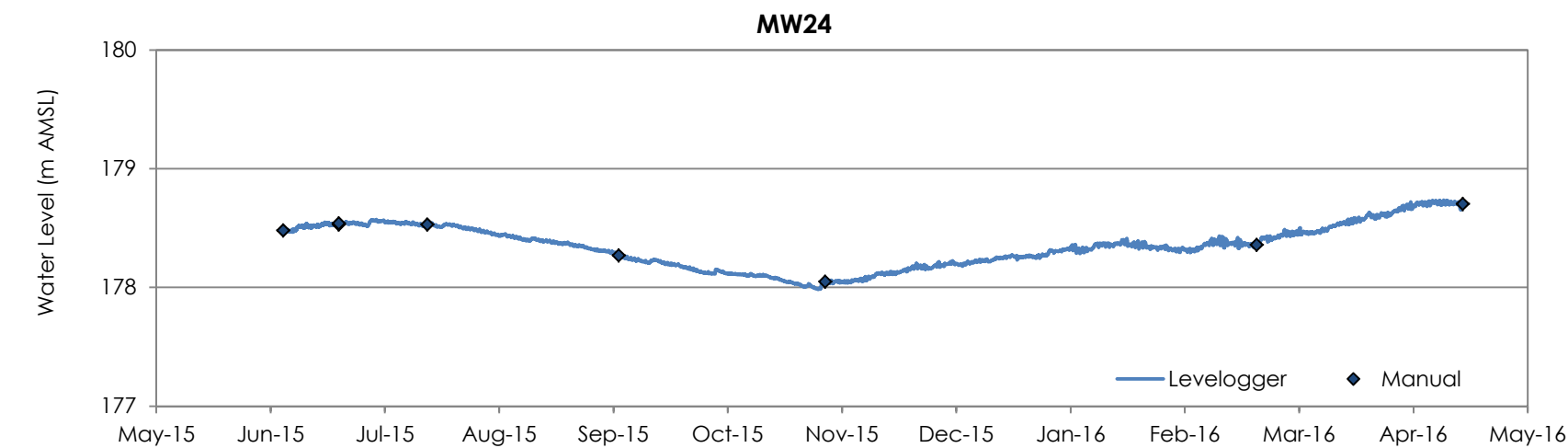
Canadian National Railway
Milton Logistics Hub

Figure No.

IR# 15-2

Title

**Hydrographs - MW1, MW10, MW12,
MW17 and MW19**



Notes:

Client/Project

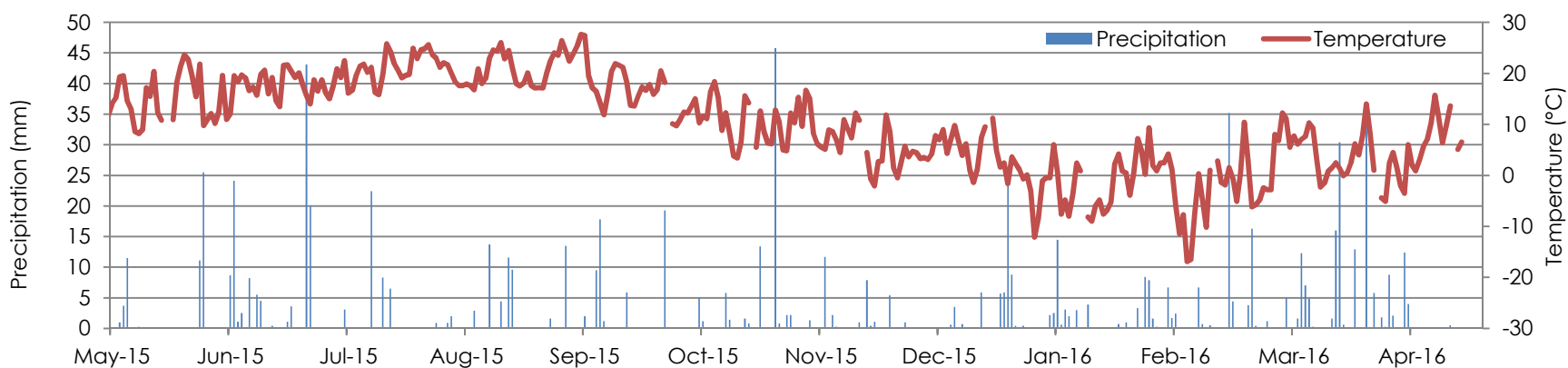
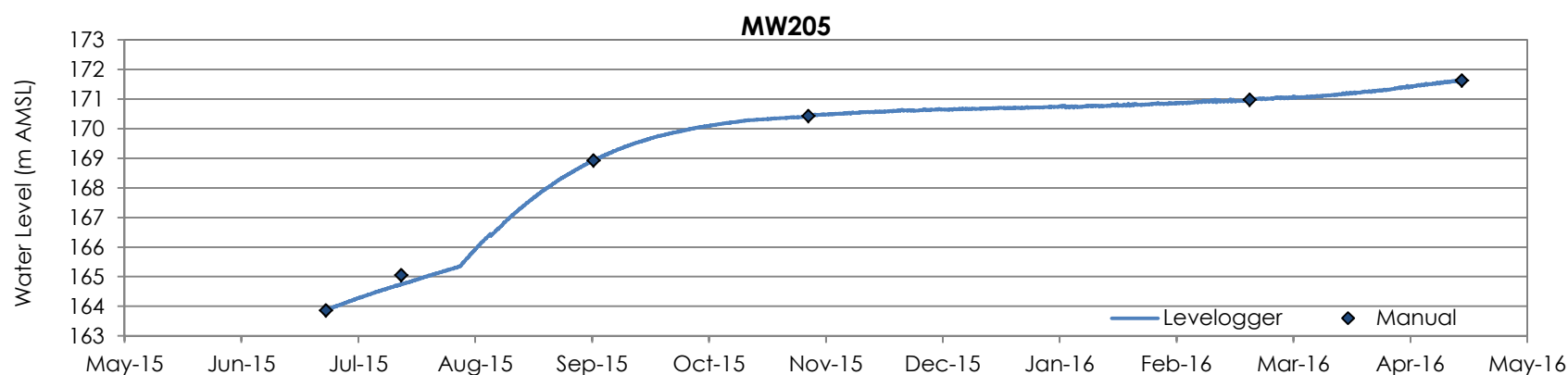
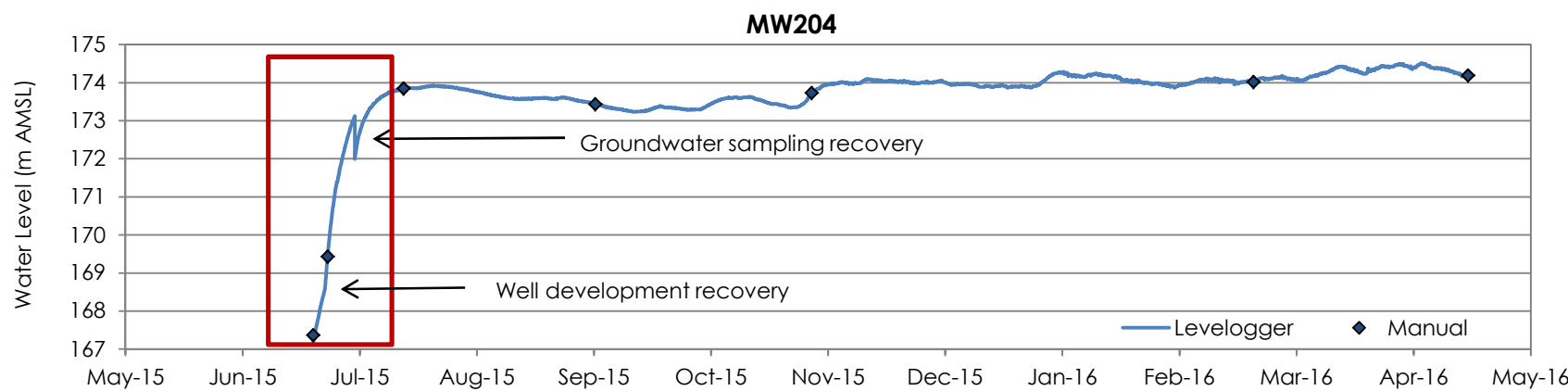
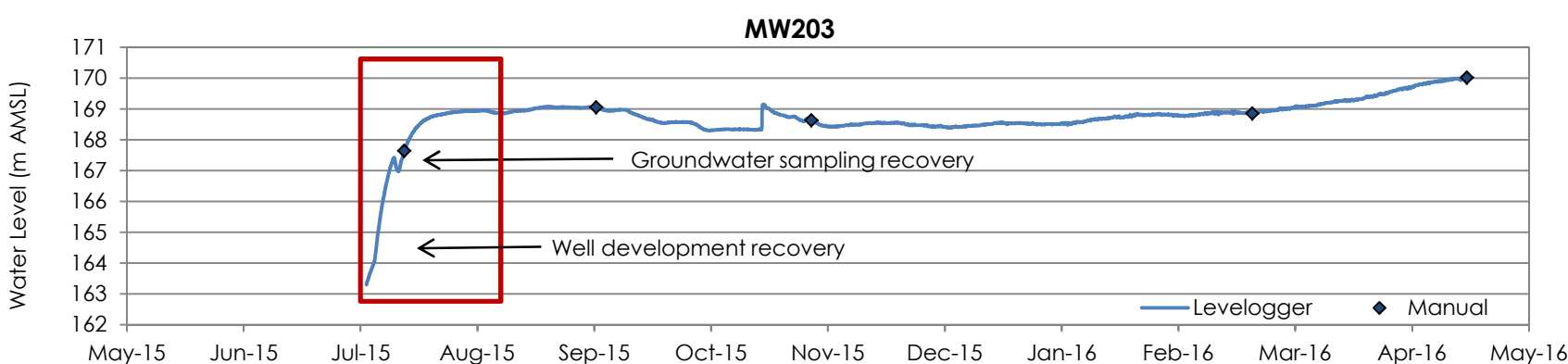
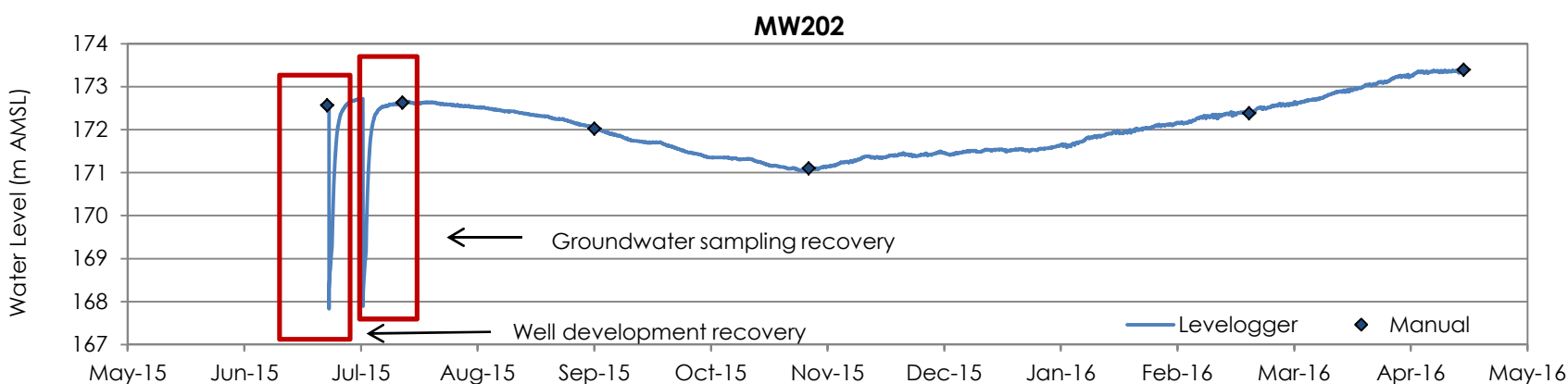
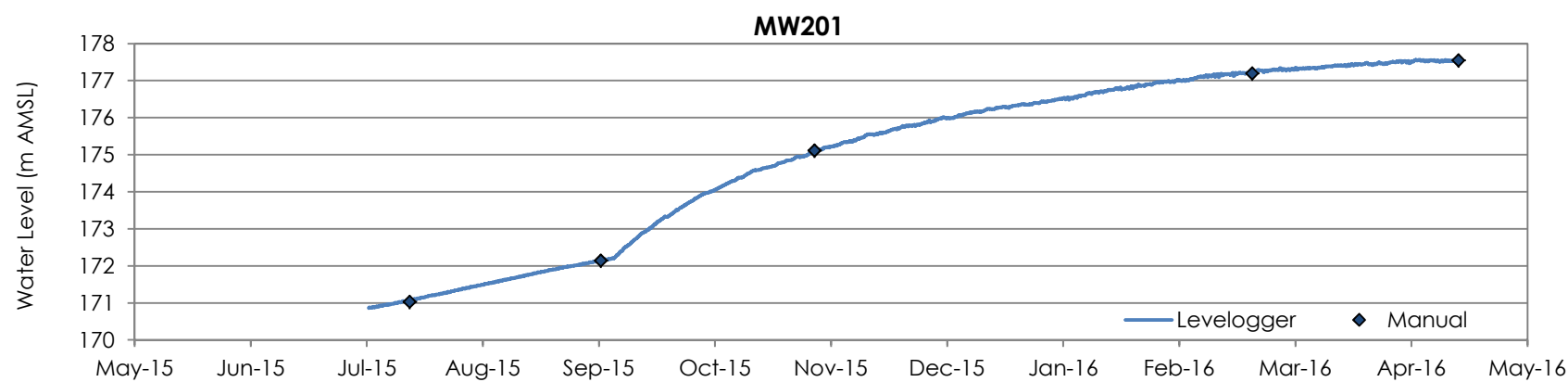
Canadian National Railway
Milton Logistics Hub

Figure No.

IR# 15-3

Title

**Hydrographs - MW24, MW28, MW30
and MW37**



Notes:

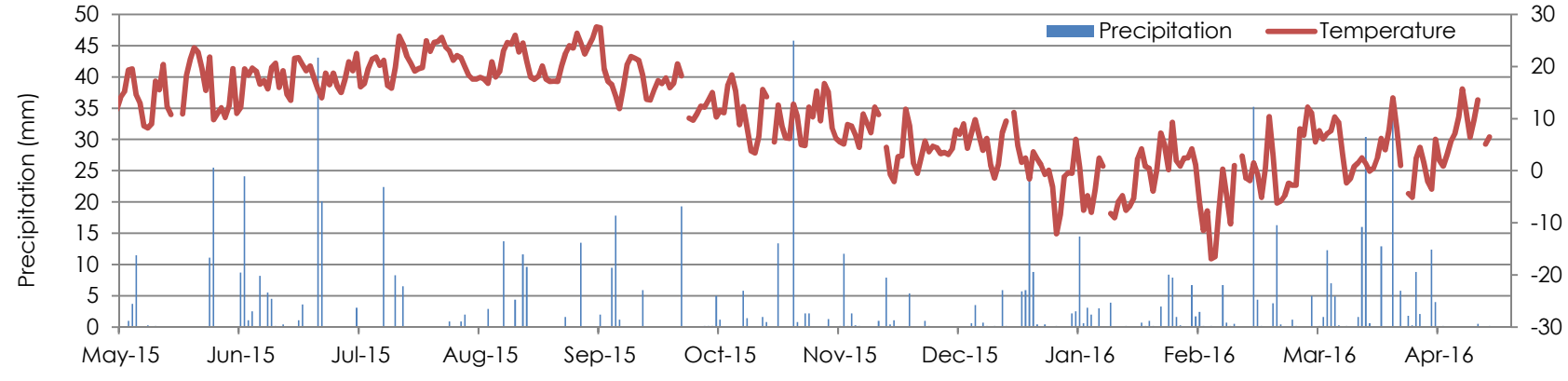
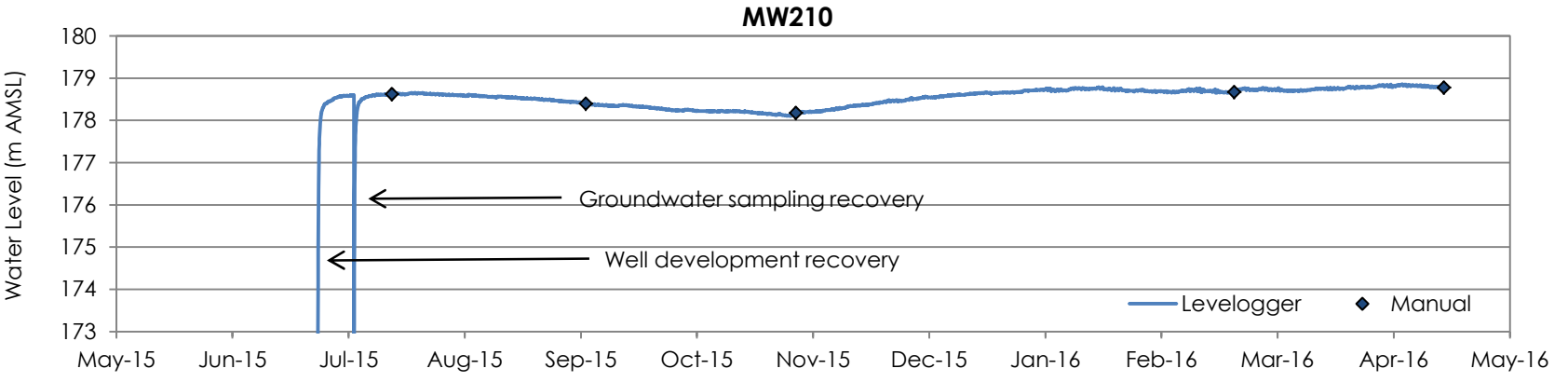
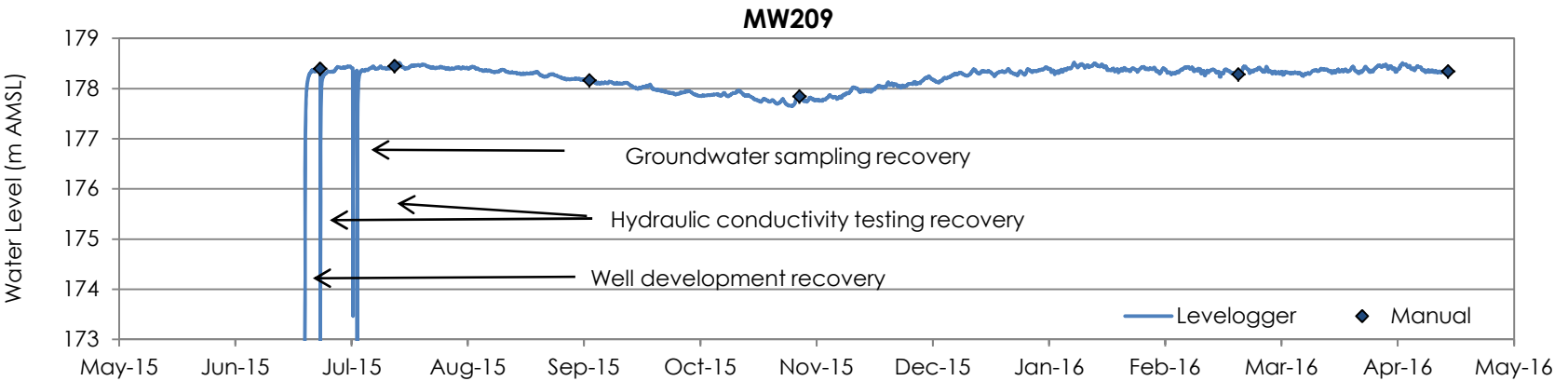
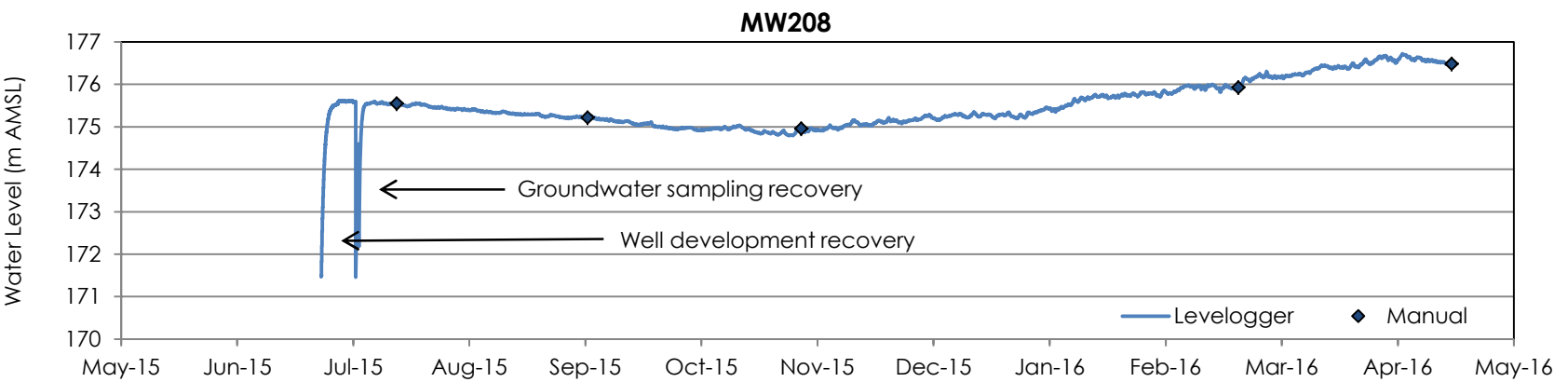
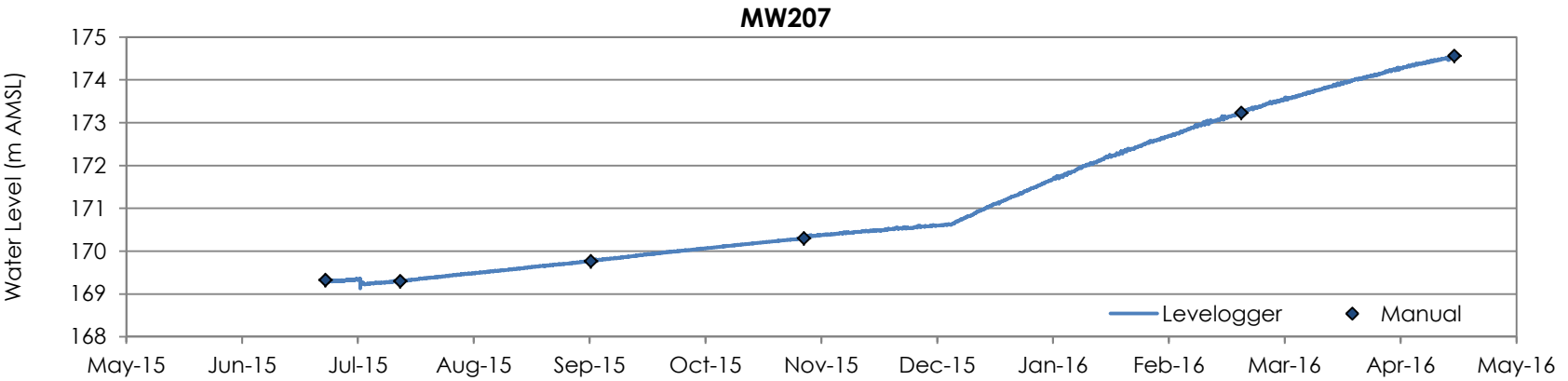
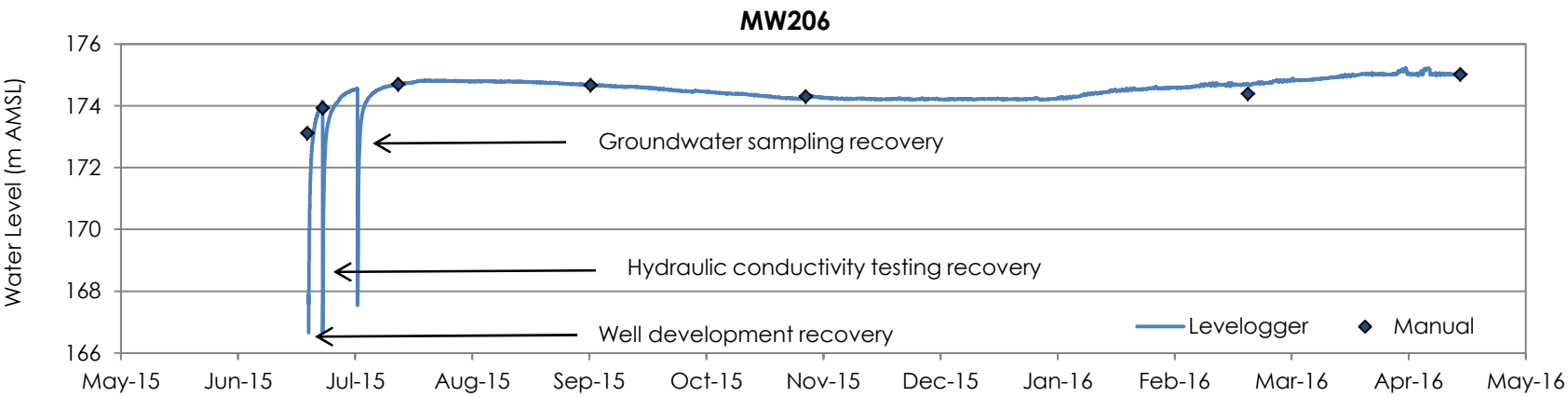
Client/Project
Canadian National Railway
Milton Logistics Hub
Technical Data Report - Hydrogeology

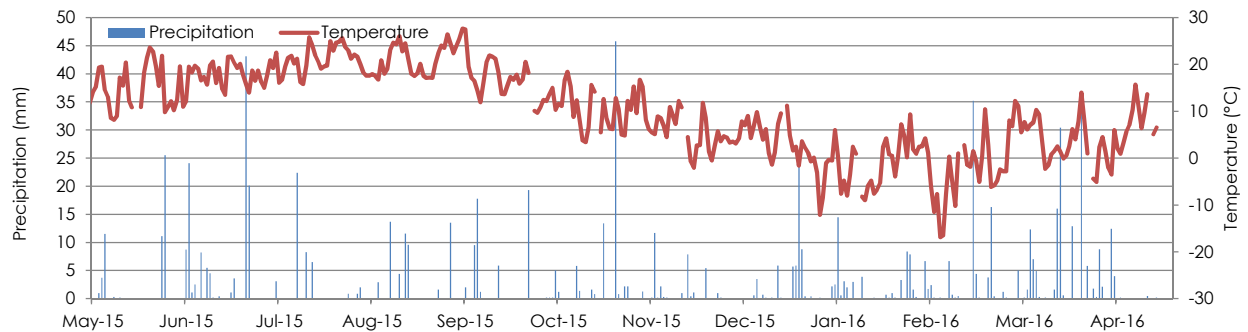
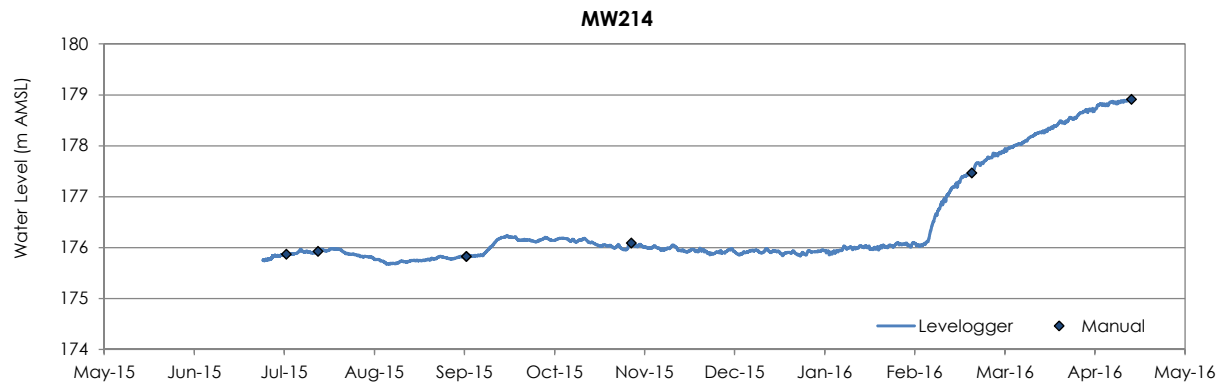
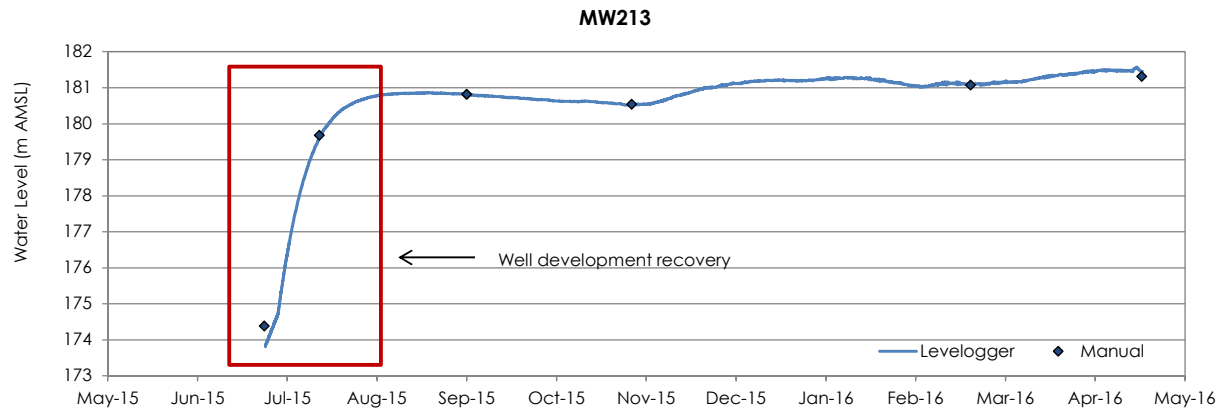
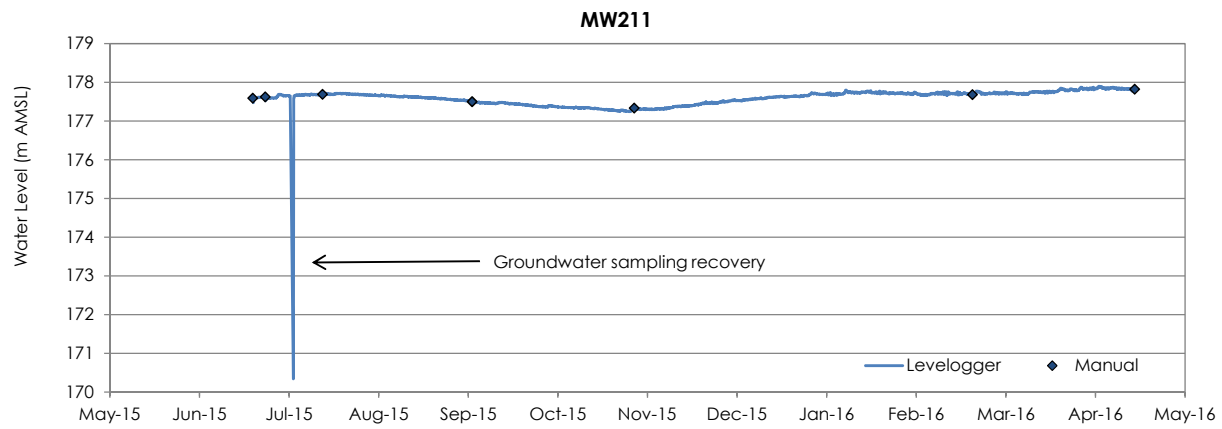
Figure No.

IR# 15-4

Title

Hydrographs - MW201 to MW205





Notes:

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Canadian National Railway
Milton Logistics Hub
Technical Data Report - Hydrogeology

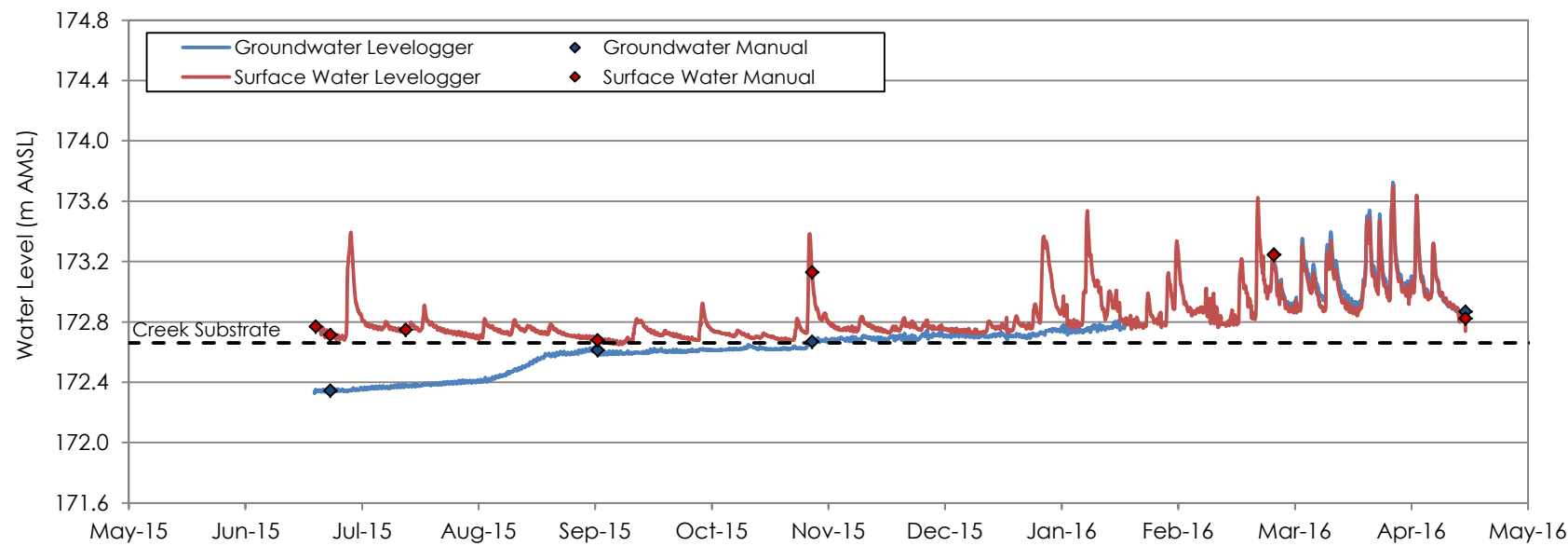
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IR# 15-6

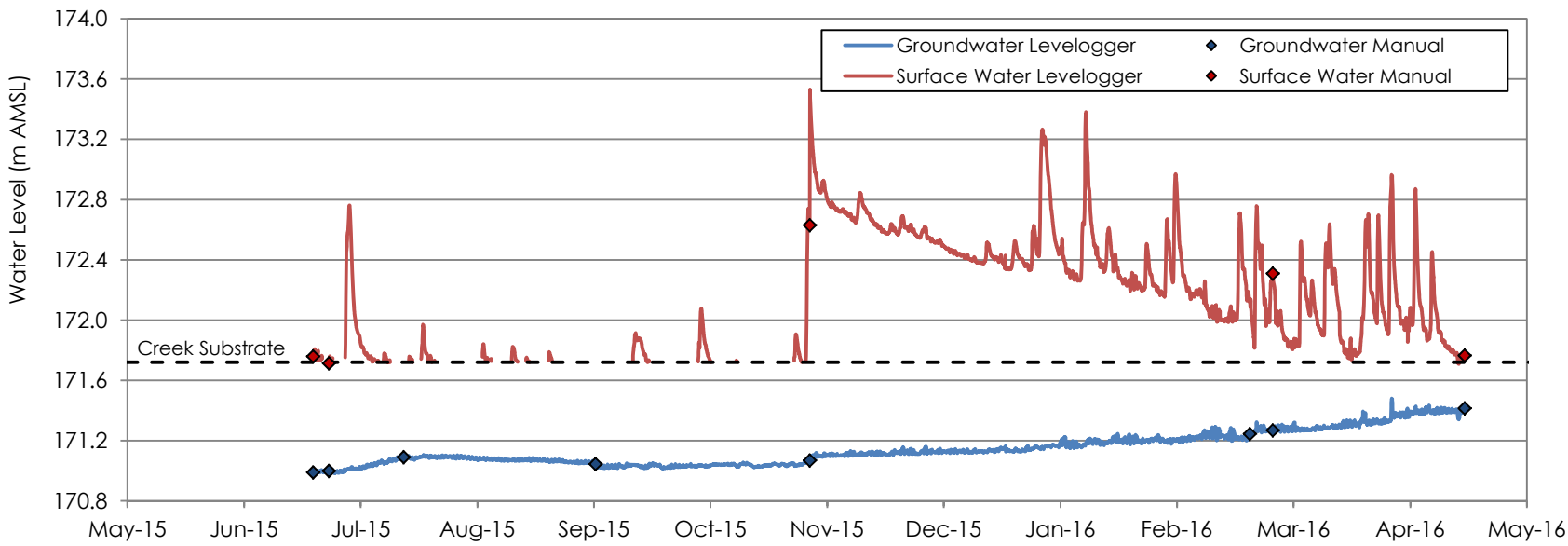
Title

**Hydrographs - MW211, MW213 and
MW214**

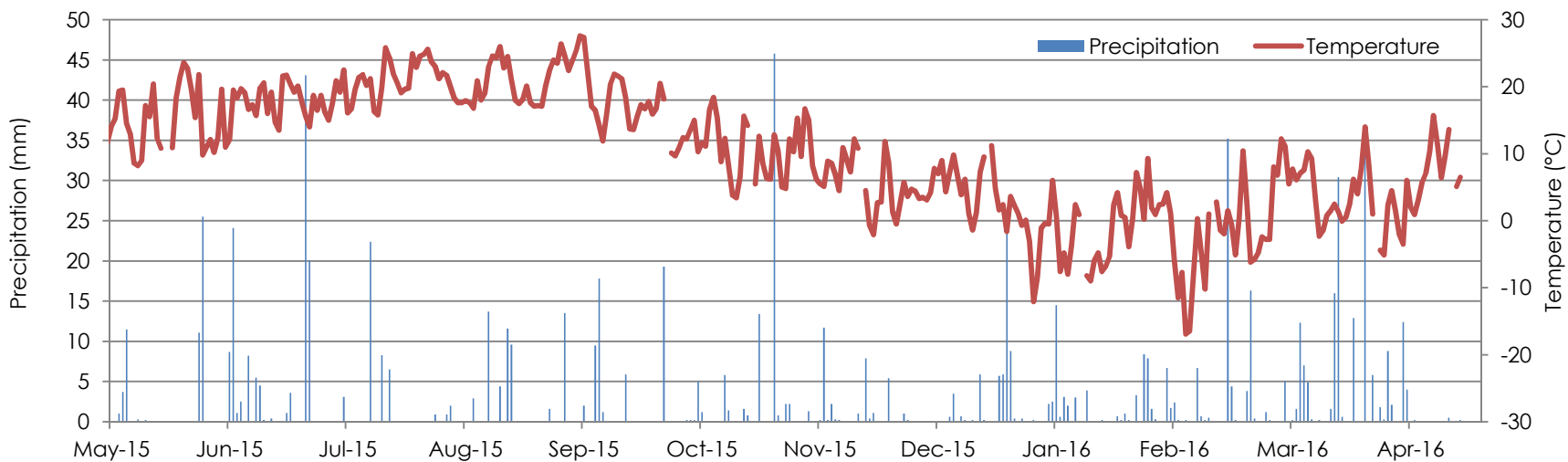
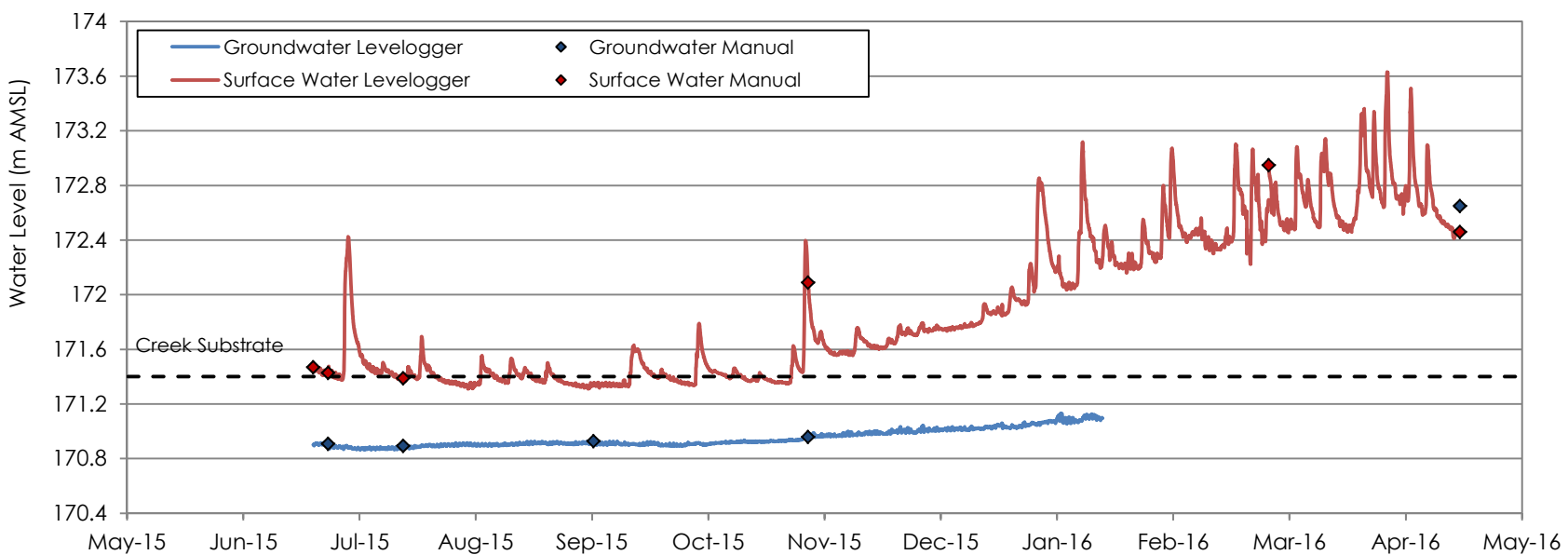
DP1-15



DP2-15



DP3-15

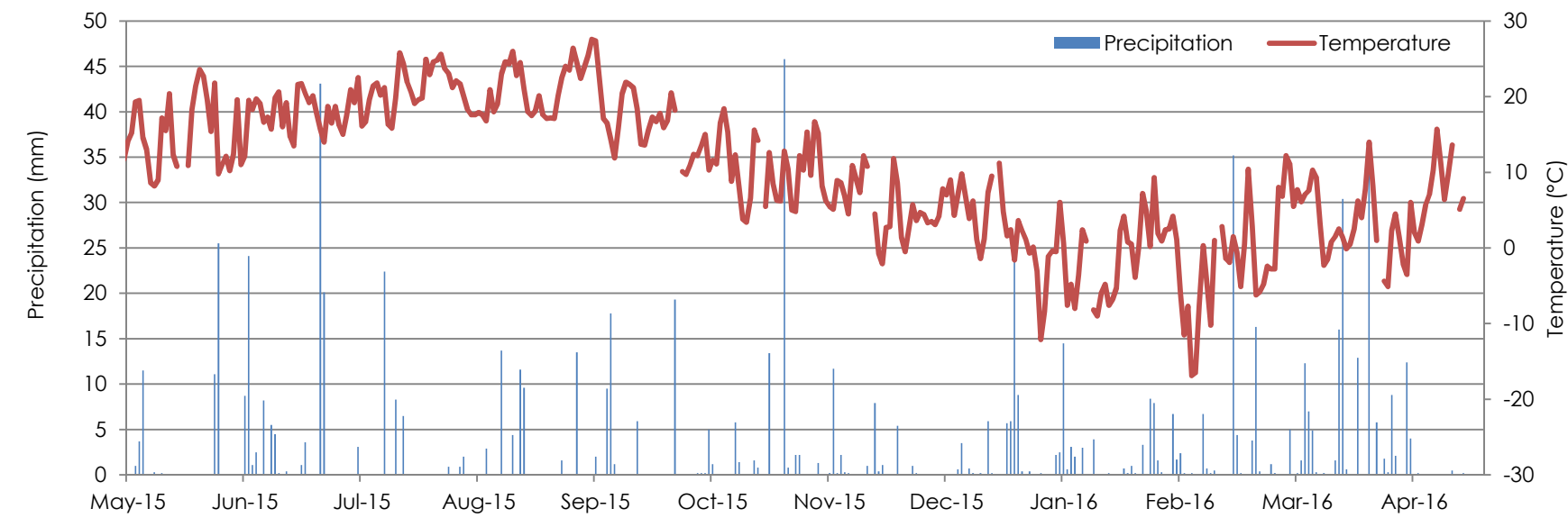
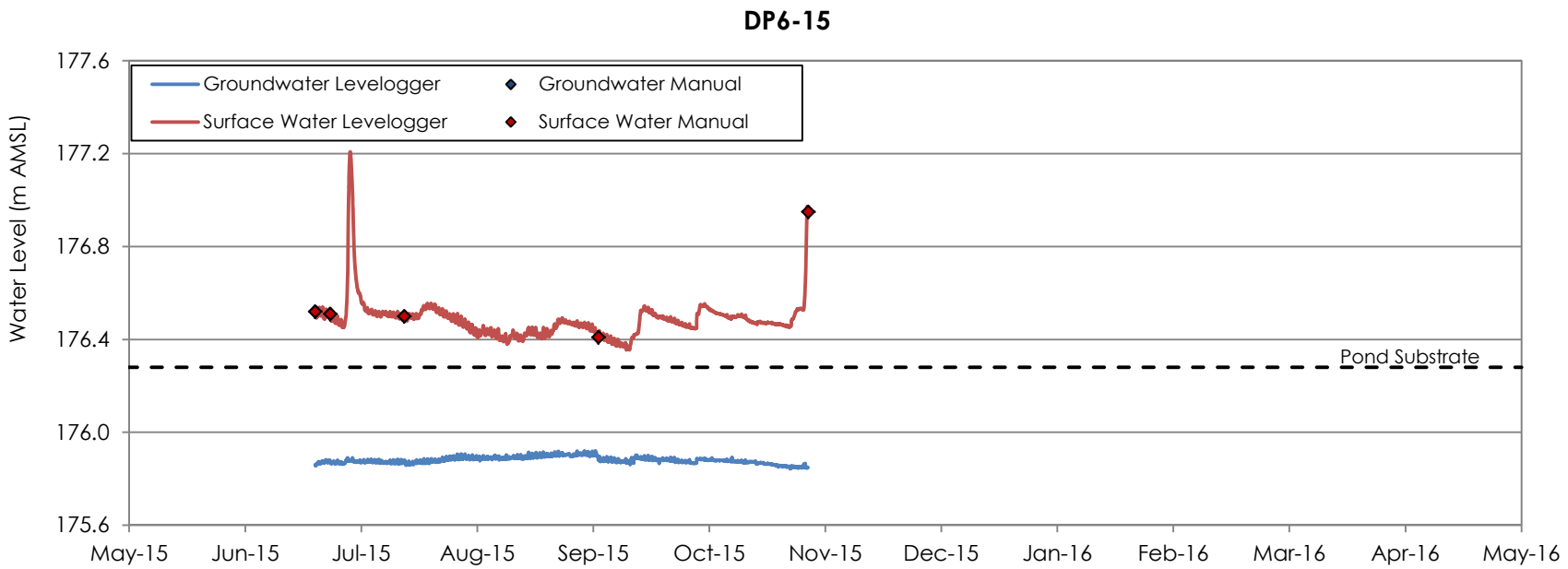
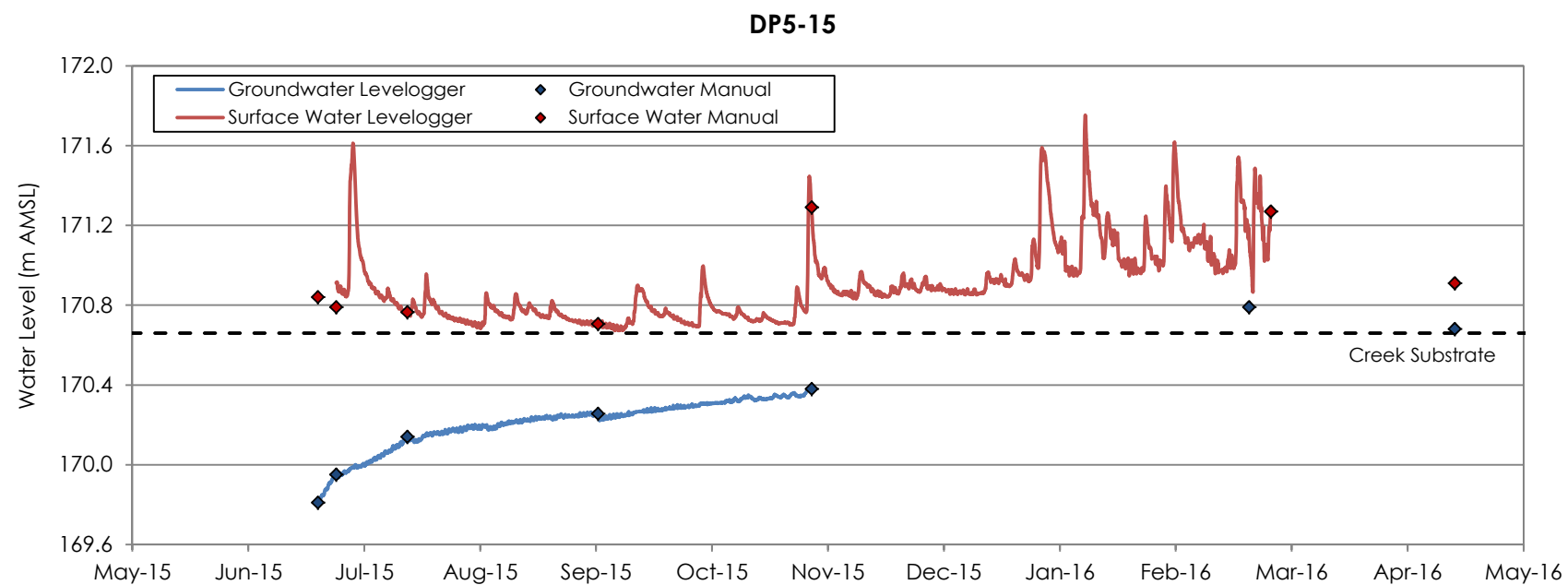
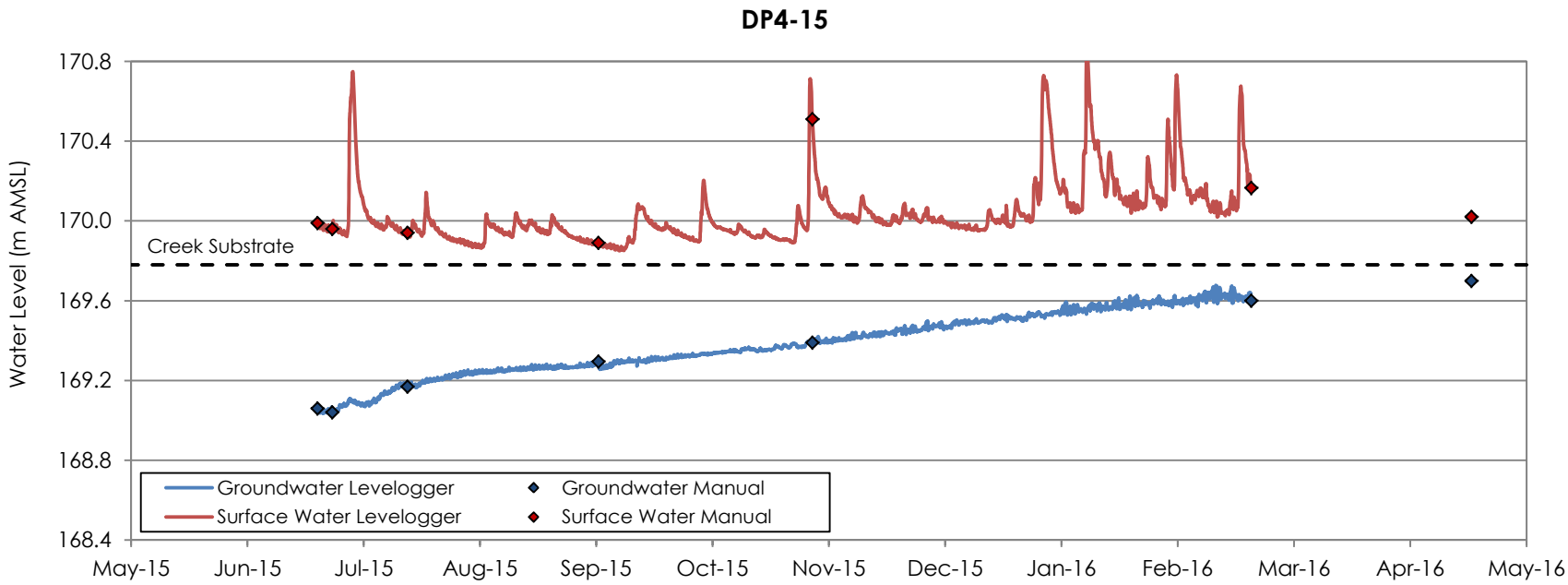


Notes:

Client/Project
Canadian National Railway
Milton Logistics Hub
Technical Data Report - Hydrogeology

Figure No.
IR# 15-7

Title
Hydrographs - DP1-15 to DP3-15



Notes:

Data loggers installed at DP6-15 were noted as missing during the February 2015 site visit. Loggers were replaced in April 2016.

Client/Project

Canadian National Railway
Milton Logistics Hub
Technical Data Report - Hydrogeology

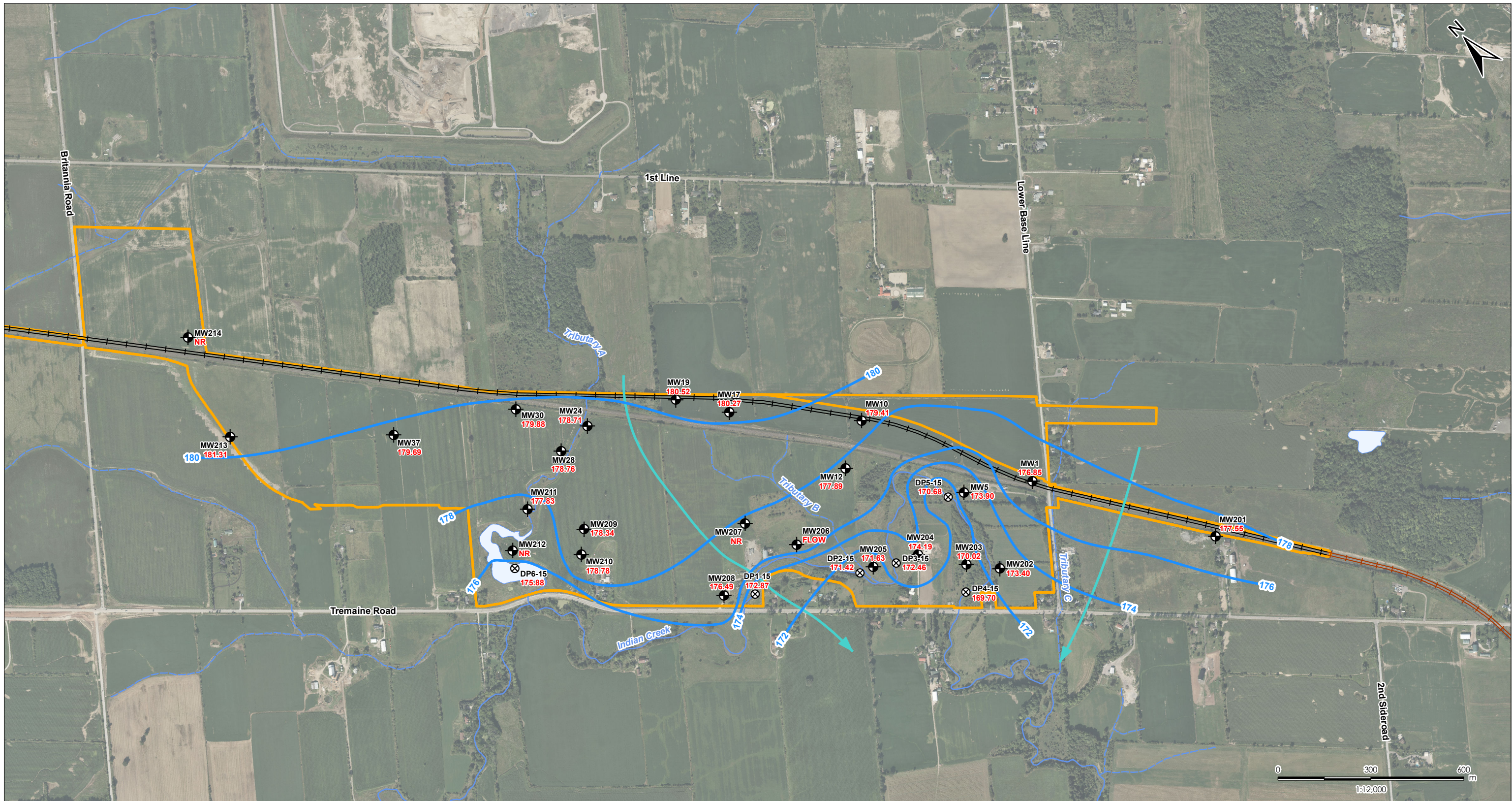
Figure No.

IR# 15-8

Title

Hydrographs - DP4-15 to DP6-15

\\Cd1220-102\01_609\active\60960844\drawing\MXD\Hydrogeology\Report_Figures\CEAA_Response\160960844_CEEA_FigR15_9_GW_Flow.mxd
Revised: 2016-05-17 By: p.worsell



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, 2016. Site layout: July 10, 2015.
3. Orthoimagery © First Base Solutions, 2016. Imagery taken in 2014.
4. Flow patterns interpreted from water levels measured in April 2016. Data provided snapshot of site conditions and may not be representative of conditions year-round.

Legend

Project Components

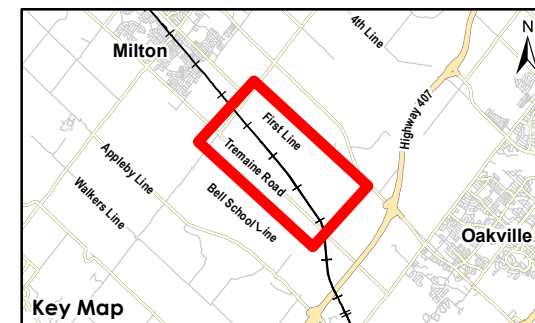
- Project Development Area
- Existing Double Track Mainline
- Double Track - Mainline

Existing Features

- Permanent Stream
- Intermittent Stream
- Waterbody

- 175.61 Groundwater Elevation (mAMSL) - April 2016
- Borehole with Monitoring Well
- Drive-Point Piezometer
- Groundwater Contour (mAMSL)
- Interpreted Direction of Groundwater Flow

- NR Groundwater Elevation Not Fully Recovered at Time of Measurement
- FLOW Artesian Condition



Client/Project
Canadian National Railway
Milton Logistics Hub

Figure No.
IR# 15-9
Title
Groundwater Flow

May 2016
160960844

ATTACHMENT IR16 – SURFACE WATER CONTAMINANTS OF CONCERN

The following supplemental information is provided in response to IR16 of the additional information request received from the Canadian Environmental Assessment Agency (CEAA) on March 15, 2016.

CONTAMINANTS OF CONCERN DURING OPERATION

The parameters addressed below are those of concern in the railway industry¹.

1. **Sediment/Turbidity** – Based on the post-construction sediment loading estimates presented in Table 6.7 (Appendix E.15, page 71) and the surface runoff presented in Table 6.6 (Appendix E.15, page 69), the estimated average annual sediment concentration from the PDA will be 0.545 mg/L. Post-construction sediment discharge estimates represent a 44% reduction from existing condition estimates achieved primarily through a sedimentation treatment process approach including grassed swale stormwater collector ditches, Oil Grit Separators (OGS) and stormwater management ponds (SWM) yielding an estimated minimum of 80% suspended solids removal.
2. **Oxygen Levels and Water Temperature** – Although railway runoff quality literature does not indicate that dissolved oxygen and temperature are specific concerns, there is general concern regarding the effect of stormwater ponds on discharge temperature and dissolved oxygen levels. As indicated in Appendix E.15 Section 6.2.1.3.1.2 (page 71), the existing shallow on-line agricultural pond on Tributary A will be removed and replaced with a reconstructed natural channel and riparian wetland cells, reducing thermal charging opportunities. Indian Creek is proposed to undergo significant riparian vegetation planting which will offer shading to the watercourse where shading opportunities are limited now. Further, the proposed SWM system will utilize subsurface storm catchbasins, sewers, grassed swales and OGS units, all of which will limit thermal charging opportunities for runoff. The SWM ponds are deeper and will utilize subsurface/bottom draw outlet techniques that also mitigate against the release of thermally charged surface water during warmer months. The focus on stormwater treatment components that limit thermal charging of discharge also contribute to increasing potential dissolved oxygen concentrations. The limited nutrient and organic content availability in the Milton Logistics Hub runoff will reduce Biochemical Oxygen Demand (BOD), thereby reducing the potential for low dissolved oxygen concentrations.
3. **Phosphorus and other nutrients** – Based on the estimated post-construction annual phosphorus load in Table 6.8 (Appendix E.15, page 72-73) and runoff in Table 6.6 (Appendix E.15, page 69), annual average total phosphorus is estimated at 0.55 mg/L and represents an estimated 70% Total Phosphorus (TP) reduction through the SWM system and an overall 24% reduction in TP from the PDA compared to the existing

¹ Appendix E.15 – Hydrology and Surface Water Quality Baseline Study and Effects Assessment TDR discusses Sediment/Turbidity, Oxygen Levels and Water Temperature, phosphorus, metals, hydrocarbons and salinity. These parameters are viewed to be the primary parameters of concern for the Milton Logistics Hub. A review of runoff and stormwater quality from the rail sector literature confirmed that metals, hydrocarbons and pesticides were the primary contaminants of concern in the railway industry (Larsson, 2004; Burkhardt et al, 2008; Gill, 2012; Gil and Im, 2012; Vo, et al, 2015). Similarly, sedimentation of suspended solids, heavy metals and oil separation are viewed as the primary water quality concerns for rail operations in local Ontario applications (Toronto Water, 2013; AECOM, 2010; MRC, 2011).

condition. Ammonia is not expected to be a contaminant of concern at the Milton Logistics Hub. The main sources of ammonia in urban stormwater include organics breakdown and fertilizer use. Organics sources include vegetation and fecal matter. The Milton Logistic Hub will have limited landscaped area with limited lawn and vegetation management. As a result of the limited landscape area and low maintenance approach to landscape features, fertilizer use is expected to be restricted or limited. Thus no substantive ammonia sources are expected and therefore ammonia is not expected to be a parameter of concern.

4. **Metals** – Heavy metals have been documented to exist in railway runoff. Vo, et al. (2015) and Burkhardt et al. (2008), indicate that the primary sources of metals in railway runoff from non-electrified rail include abrasion processes from braking, wheel/track friction and turning. Iron is the predominant metal related to these processes. Burkhardt et al. (2008) in a water quality assessment of 7200 km of Swiss Federal Railways (SBB) indicated that iron represented 93.3 - 97% of emitted brake (iron brakes), wheel and rail abrasion materials. Copper, zinc, manganese, and chromium were also present in runoff but in loads approaching 2 orders of magnitude lower than iron. While few studies have examined metals concentrations in rail runoff, Larsson (2004) examined a stabling yard, the rail form most similar to the proposed intermodal facility. Larsson (2004) observed concentrations of 25 – 92 ug/L for copper, 23 – 180 ug/L for zinc, 2.9 – 5.3 ug/L for chromium and 9.3 – 16 ug/L for lead with runoff quality for iron unavailable. Metals generated by braking, wheel on track and turning friction is particulate in nature and highly adsorbed to soil and silt particles. It is anticipated that based on the multi-component sedimentation treatment approach proposed at the Milton Logistics Hub that metals concentrations in stormwater discharge will be less than CCME Canadian Water Quality Guidelines for the protection of aquatic life (Appendix E.15, Section 6.2.1.3.1.4, page 73).
5. **Hydrocarbons** – The primary sources of hydrocarbons in rail runoff are exudation/leaching from creosote treated wooden ties, fueling and lubrication. Quantitative information regarding hydrocarbon concentrations in railway runoff are scarce (Vo, et al, 2015; Gil and Im, 2014). The Milton Logistics Hub is not proposed as a main fueling or maintenance depot and therefore engine fueling and car maintenance will be limited to on an as required basis. However, Milton Logistics Hub equipment will be fueled and lubricated on site at fueling and maintenance facilities. The Milton Logistics Hub is not proposed to handle bulk hydrocarbons, fuels or lubricants. The stormwater management treatment approach is proposed to incorporate the use of three oil separation and capture approaches to capture and divert Light Non-Aqueous Phase Liquids (LNAPLs) from advancing through the stormwater system including using oil grit separators and subsurface draw stormwater pond outlets which result in the stormwater ponds acting as LNAPL containment features. This multi-component, treatment approach is expected to reduce hydrocarbon releases to the environment (Appendix E.15, Section 6.2.1.3.1.4, page 73).
6. **Salinity and Salt Management** – Appendix E.15, Sections 6.2.1.3.1.5 and 6.2.1.3.2.1 discuss salinity. Salinity concerns arise from the use of road salt for road based traction control during the cold season. Salt application rates will be determined based on site conditions. Primary traction vehicular access will include Intermodal trucks and site

vehicles. The Transportation Association of Canada (2013) and the Canadian Parking Association (2014) provide salt management planning guidance in the form of the 4 Rs of salt management (Right: Material, Amount, Place and Time) to reduce salt use through the following: increased sand use instead of salt; use of appropriate salt amount where required for traction control; examination of pooling areas where ice can form to selectively apply to problem zones; appropriate timing of traction control with respect to temperature, and; management of snow in purpose built snow storage areas.

CONCLUSION

The additional information above is to provide clarity to the information presented in the EIS; however the information does not change the assessment of effects or the results of the EIS.

REFERENCES

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- Burkhardt, M., L. Rossi and M. Boller, 2008. Diffuse release of environmental hazards by railways. *Desalination* 226(2008) 106-113.
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<http://canadianparking.ca/getting-smart-about-salt/?>
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- Larsson, M., 2004. Toxicity analysis by Luminous Bacteria – Investigation of Surface Water and groundwater from Gallivare Yard. Division of Waste Technology – Department of Civil Engineering, Lulea University of Technology, Sweden, IN: Vo et al. (2015)
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- Vo, P.T., H.H. Ngo, W. Guo, J.L. Zhou, A. Listowski, B. Du, Q. Wei and X.T. Bui, 2015. Stormwater quality management in rail transportation – Past, present and future. *Science of the Total Environment* 512-513 (2015) 352-363.

ATTACHMENT IR17 – SURFACE WATER QUALITY EFFECTS DURING CONSTRUCTION

Attachment IR17 – Surface Water Quality Effects During Construction

Prepared on May 13, 2016

The following supplemental information is provided in response to IR17 of the additional information request received from the Canadian Environmental Assessment Agency (CEAA) on March 15, 2016.

PREDICTED CHANGES TO SURFACE WATER QUALITY DURING THE CONSTRUCTION PERIOD

The parameters of concern during construction are sediment, turbidity, oxygen, temperature and change in flow (GGHACA, 2006). Changes in runoff during construction are discussed in Section 6.1.1 (Appendix E.15, page 61).

ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS OF CHANGES TO SURFACE WATER QUALITY DURING THE CONSTRUCTION PHASE

Fish and Fish Habitat

Section 6.5.1.9.5 of the Environmental Impact Statement (EIS) (page 185-187) provides an assessment of change in water quality on fish and fish habitat.

DFO provides guidance on measures to take to avoid causing harm to fish and fish habitat (DFO, 2013) including guidance on construction timing, site selection, erosion and sediment control (ESC), operation of equipment and fish protection. Implementation of best practices and regulatory requirements in ESC are expected to mitigate against an increase in sediment, turbidity in site discharge as well as maintain dissolved oxygen and temperature to within existing condition thresholds (Appendix E.15, Section 6.4.1, page 76).

The project site will be serviced by an ESC Plan that will provide a range of mitigation measures referred to in Appendix E.15, Section 6.3.1, page 74. In addition further mitigation measures are expected to include:

- limit site vegetation clearing and grubbing until required in the construction phase;
- reduce the time between vegetation removal and soil exposure and stabilization, employ a multi-barrier ESC approach that reduces runoff at the source and minimize the entrainment of sediment in runoff and excavation dewatering, site isolation and material stabilization measures;
- incorporate early construction of operational phase stormwater ponds and other controls to act as construction phase sedimentation ponds and environmental monitoring and inspection during construction.

A detailed ESC Plan will be developed in the detailed design phase of the project and will take into account best practices in ESC, regulatory requirements and recommendations.

In-water works will also be limited to DFO in-water works timing windows to protect aquatic species during sensitive spawning periods unless specific mitigation measures are implemented and a variance is received.

The above mitigation activities are expected to reduce the potential for elevated sediment release from the site, facilitate monitoring and enable adaptive management to provide ESC improvements and remediation where required. During construction, vegetation hoarding will be practiced and it is expected that organic material in the site

Attachment IR17 – Surface Water Quality Effects During Construction

Prepared on May 13, 2016

drainage system will be limited. As a result, it is expected that little organic material will be available to increase turbidity apart from entrained sediment, which will be addressed through ESC measures. The reduction in organic material in site runoff will also limit Biochemical Oxygen Demand (BOD) which depletes dissolved oxygen in receiving water. The early construction and deployment of stormwater ponds with thermal controls as described in the memo response to IR16 will limit thermal charging of site runoff during construction.

Hydrocarbons as a result of vehicle fueling spills will be mitigated by the use of construction equipment fueling procedures, fueling pads, and minimum setback buffer distances from water bodies. DFO (2013) provides guidance to contaminant and spill management.

Nutrient and metals parameters during construction are not anticipated to be of concern when accounting for ESC controls (Appendix E.15, Section 6.4.1, page 76).

Potential effects during the construction phase on fish and fish habitat are described in Table 6.9 (page 169), Table 6.11 (page 174), and Sections 6.5.1.8 (page 173-174) through 6.5.1.9 (page 175-189) of the EIS.

Migratory Birds

Wetland habitat for breeding migratory birds is relatively limited in the LAA. As discussed in Section 6.5.2.9.1 (page 197-200) of the EIS, most wetland breeding birds were passerines, which nest in vegetation above the water and are anticipated to have low sensitivity to change in water quality such as, sedimentation, turbidity, temperature or oxygen levels. Regardless, mitigation is expected to avoid sediment from entering wetlands.

Section 6.5.2.9.2 (page 200-202) of the EIS provides an assessment of change in migratory bird habitat, including wetland habitat.

Species at Risk

Potential effects during construction to species at risk (SAR) are described in Section 6.5.3.9 of the EIS. Section 6.5.3.9.3 (page 214-217) of the EIS provides an assessment of a change in SAR critical habitat and residences, including potential effects from contamination of surface water. Two species at risk, Western Chorus Frog and Snapping Turtle, discussed in Section 6.5.3.9 occur in wetland habitat and may be affected by water quality. Breeding Western Chorus Frog may be sensitive to sediment or turbidity in water resulting from construction, in particular eggs and young larva. Changes in oxygen levels or water temperatures may also result in mortality of Western Chorus Frog eggs or larva. However, the Western Chorus Frog critical habitat is set back from the PDA and located in the LAA. With mitigation in place, no changes to water quality in the critical habitat are anticipated. Furthermore, the critical habitat within the LAA is currently not being used by Western Chorus Frog. As such, any temporary change in water quality during construction is unlikely to result in mortality to the species. Snapping Turtle will utilize a variety of wetland environments and are not particularly sensitive to water quality factors such as sedimentation, turbidity, water temperature or oxygen levels. As such, any small changes in water quality during construction are unlikely to affect this species.

Prepared on May 13, 2016

CONCLUSION

The additional information above is to provide clarity to the information presented in the EIS; however the information does not change the assessment of effects or the results of the EIS.

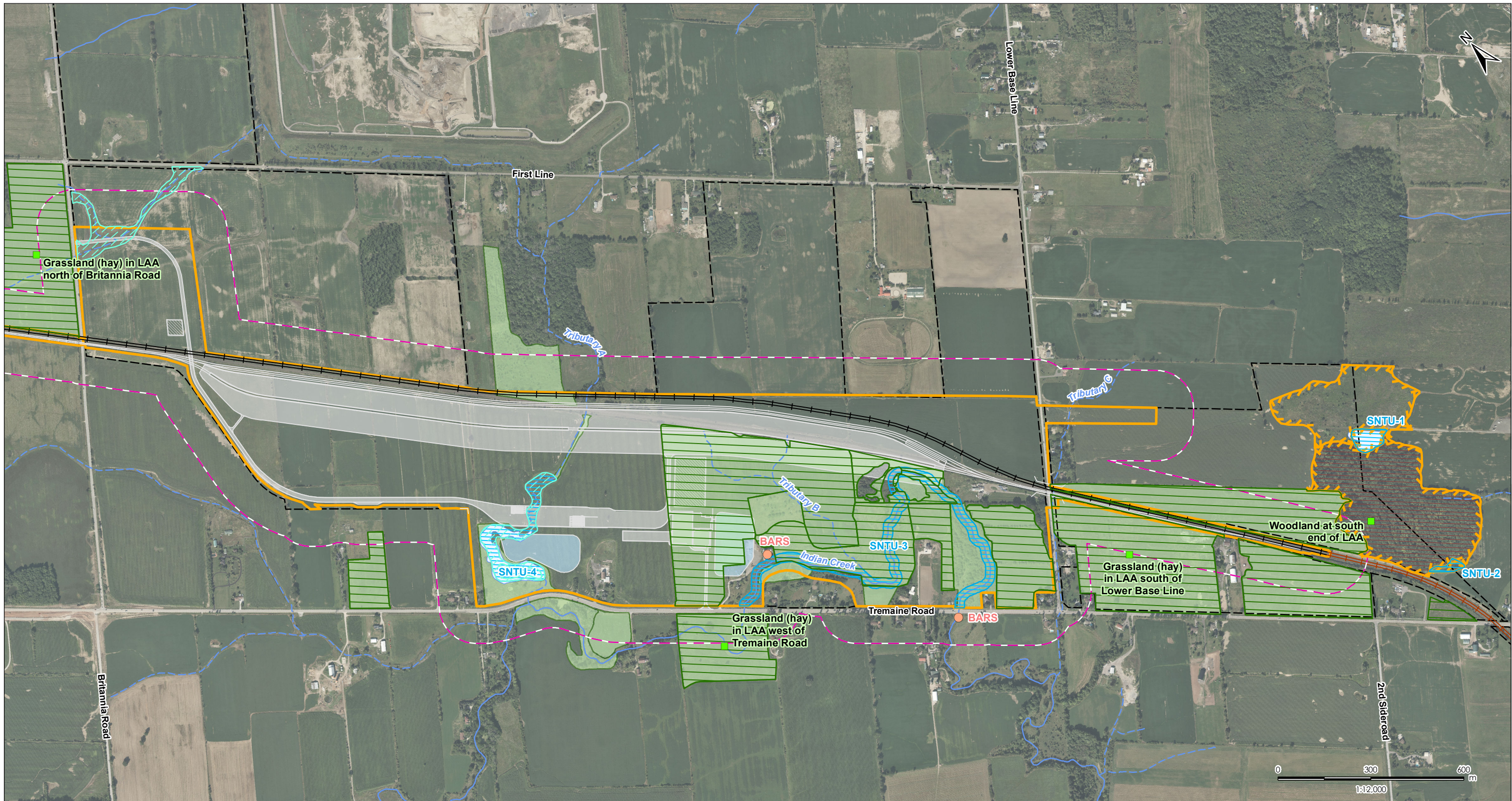
REFERENCES

DFO, 2013. Fisheries and Oceans Canada. Measure to Avoid Harm to Fish and Fish Habitat (<http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html>)

GGHACA, 2006. Erosion and Sediment Control Guideline for Urban Construction. Greater Golden Horseshoe Area Conservation Authorities.

ATTACHMENT IR19 –WILDLIFE NOISE ASSESSMENT LOCATIONS

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Revised: 2016-05-17 By: p.worsell



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, 2016. Site layout: July 10, 2015.
3. Orthoimagery © First Base Solutions, 2016. Imagery taken in 2014.

Legend

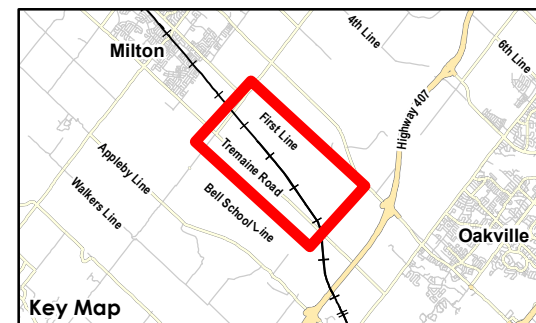
Project Components

- Project Development Area
- Local Assessment Area
- Existing Double Track Mainline
- Double Track - Mainline
- Project Component
- CN-Owned Property
- SWM Pond

Existing Features

- Permanent Stream
- Intermittent Stream
- Waterbody
- Barn Swallow Breeding Habitat (BARS)
- Bobolink/Eastern Meadowlark Breeding Habitat
- Grassland Migratory Bird Habitat
- Woodland Migratory Bird Habitat
- Snapping Turtle Habitat (SNTU)

- Wetland Migratory Bird Habitat
- Western Chorus Frog Critical Habitat
- Representative Location of Noise Assessment



Client/Project
Canadian National Railway
Milton Logistics Hub

Figure No.
IR# 19

Title
**Wildlife Noise Assessment
Locations**

May 2016
160960844

ATTACHMENT IR22 – SUMMARY OF ASSESSMENT OF POTENTIAL EFFECTS ON FISH AND FISH HABITAT

Potential Environmental Effect (EIS Table 6.9, page 169)	Effect Pathway (EIS Table 6.9, page 169)	Measurable Parameter(s) and Units of Measurement (EIS Table 6.9, page 169)	Quantitative Description of Existing Environmental Conditions	Description of how the Project is expected to result in changes to the measureable parameter	Discussion of Implications of these changes to Fish and Fish Habitat
Change in fish habitat	Change in riparian and in-water habitat availability (including critical habitat of SAR)	<ul style="list-style-type: none">Areal extent of altered or destroyed habitat (m²)	<p>As reported in Section 6.5.1.9.2 (page 175 to 180) of the Milton Logistics Hub EIS, the following existing habitat conditions were observed during field investigations:</p> <p>Indian Creek existing channel area where works are to take place (i.e., channel realignment reach): 2,341 m²</p> <p>Approximate Indian Creek channel area within PDA: 15,975 m²</p> <p>Tributary A to Indian Creek existing channel area where works are to take place (i.e., channel realignment, wetland, and culvert installation): 3,535 m²</p>	<p>As reported in Section 6.5.1.9.2 (page 175 to 180) of the Milton Logistics Hub EIS, the following changes to existing conditions are expected as a result of the Project:</p> <p>Indian Creek</p> <ul style="list-style-type: none">Change in channel area during low flow conditions: -2,341 m² (loss of habitat as a result of channel realignment)Change in channel area including riparian wetlands accessible during high flow conditions: 532 m² (gain in habitat)Net change in channel enhancements: 4,298 m² (gain in habitat) <p>Tributary A to Indian Creek</p> <ul style="list-style-type: none">Removal of channel at various points within the project area (cumulative removal): -1,035 m²Wetland (on-line agricultural pond) (to be overprinted): -2,500 m²Removal of culvert and berm resulting in daylighting of channel: gain of 13 m² and an increase in fish passage potential.Removal of ongoing erosion and sedimentation issues associated with breached pond berm/dam and undermined culvert.Removal of online pond (-2,500 m²) and associated impacts such as solar warming affecting water quality, obstructed fish passage and disrupted natural sediment transport processes.Construction of new channel (from culvert outlet of piped, realigned watercourse at southwestern edge of the facility): 745 m²Changes will generally result in an increase in habitat quality through implementation of natural channel design principles and riparian enhancements.	<p>It is anticipated that the proposed works as designed will not result in residual serious harm to fish, as defined by the <i>Fisheries Act</i>. Further refinement of the channel design plans will occur as required, in consultation with DFO during the <i>Fisheries Act</i> approval process. Changes will result in an increase in habitat quality and fish passage potential through implementation of natural channel design principles and riparian enhancements.</p>

Potential Environmental Effect (EIS Table 6.9, page 169)	Effect Pathway (EIS Table 6.9, page 169)	Measurable Parameter(s) and Units of Measurement (EIS Table 6.9, page 169)	Quantitative Description of Existing Environmental Conditions	Description of how the Project is expected to result in changes to the measureable parameter	Discussion of Implications of these changes to Fish and Fish Habitat
				<p>Tributary C to Indian Creek</p> <ul style="list-style-type: none">Installation of 30 m long culvert beneath a proposed noise mitigation berm will result in the alteration of a poorly defined channel that contributes indirectly to fish habitat, or supports fish habitat on a seasonal basis.	
		<ul style="list-style-type: none">Habitat productivity (Catch Per Unit Effort (CPUE), density, biomass) (may require follow-up/monitoring)	<p>Indian Creek CPUE: 0.065 fish/electrofishing second Density: 1.31 fish/m² Biomass: 9.2 g/m²</p> <p>Tributary A No fish were captured during fish community 2015 sampling in Tributary A.</p>	<p>Following implementation of the mitigation and offsetting measures (identified in Section 6.5.1.9, page 175 to 189), there are anticipated to be no changes to habitat productivity (CPUE, density, biomass).</p>	<p>Through the implementation of mitigation and offsetting measures, it is anticipated that the proposed works as designed will not result in a decrease in fisheries productivity. The channel and associated features have been designed to replicate or enhance existing features that will be altered as a result of the Project.</p>
		<ul style="list-style-type: none">Species and life stage diversity	<p>Juvenile and adult fish of 16 of the 17 species listed in Section 5.1.2 (page 20 to 30) of the Milton Logistics Hub Technical Data Report, Fish and Fish Habitat (Appendix E.4) were captured during sampling. No adult Largemouth Bass were captured during sampling.</p>	<p>No negative changes to fish species and life stage diversity are anticipated.</p>	<p>It is anticipated that there will be no negative change in fish species and life stage diversity as a result of the Project. The channel and associated features have been designed to replicate or enhance existing features that will be altered as a result of the Project. Therefore, it is anticipated that the project will not result in serious harm to fish.</p>
Change in fish movement, migration and fish passage	Change in flow rates or obstructions	<ul style="list-style-type: none">Minimum and maximum seasonal flows (m³/s)	<p>Please refer to Table 5.25 (page 53) of the Milton Logistics Hub, Hydrology and Surface Water Quality Technical Data Report (Appendix E.15) for existing flow characteristics.</p>	<p>Section 6.1.1.1 (page 62 to 67) of Milton Logistics Hub, Hydrology and Surface Water Quality Technical Data Report (Appendix E.15) presents discussion regarding predicted hydrologic characteristics resulting from the construction of the Project. The following conclusions are presented in that same report:</p> <p>Indian Creek: "The expected changes in average floodline elevations within Indian Creek are negligible (0 m) and existing condition environmental flows will be maintained (AECOM 2015a)."</p> <p>Tributary A to Indian Creek: "The relative changes in flow are small for Tributary A and environmental flows will be maintained, including flows into the unevaluated wetland downstream of the removed on-line agricultural pond dam structure and the connection with Indian Creek."</p>	<p>It is anticipated that there will no net change in hydrologic conditions in Indian Creek, and only small changes to hydrologic characteristics associated with Tributary A. The changes in Tributary A are not anticipated to result in residual serious harm to fish.</p>

Potential Environmental Effect (EIS Table 6.9, page 169)	Effect Pathway (EIS Table 6.9, page 169)	Measurable Parameter(s) and Units of Measurement (EIS Table 6.9, page 169)	Quantitative Description of Existing Environmental Conditions	Description of how the Project is expected to result in changes to the measureable parameter	Discussion of Implications of these changes to Fish and Fish Habitat
				Tributary C to Indian Creek: The culvert proposed for installation in Tributary C will be sized during detailed design to prevent changes in flow. Therefore, it is anticipated that there will be no change in existing flow conditions.	
		<ul style="list-style-type: none">Creation of flow or passage obstruction in-water	<p>There is no measureable parameter associated with the obstruction of flow.</p> <p>Indian Creek: No flow impediments were observed in the Indian Creek PDA during field investigations.</p> <p>Tributary A and Tributary C: Both tributaries are intermittent watercourses and fish passage obstruction typically occurs throughout the summer as a result of their intermittent nature (refer to Section 6.5.1.7, page 172 to 173, of the Milton Logistics Hub EIS).</p>	As discussed in Sections 6.5.1.9.3 (page 180 to 183), 6.5.1.9.6 (page 187 to 188), and 6.6.2.4.4 (page 295 to 296) of the Milton Logistics Hub EIS, creation of short-term flow or passage obstruction is possible during construction as a result of the potential need to isolate work areas in-water using coffer dams.	Obstructions to flow and fish passage are expected to be short-term. Mitigation measures will include dam and pump operation to maintain flows around the isolated work area, within the appropriate fisheries timing window. Additional, final details regarding design of isolation measures, timing, duration and magnitude of flow or passage obstructions will be determined in consultation with DFO during the <i>Fisheries Act</i> approval process. No residual serious harm to fish is anticipated as a result of short-term flow or passage obstructions created by the Project.
Change in fish mortality	Change in direct mortality risk	<ul style="list-style-type: none">Fish mortality occurrences	No measureable parameter is associated with existing fish mortality risk. Increase in mortality risk can't be quantified; however, mortality occurrences during construction can be measured in numbers of dead fish.	As discussed in Sections 6.5.1.9.4 (page 183 to 184) and 6.5.1.9.5 (page 185 to 187) of the Milton Logistics Hub EIS, short-term increases in the risk of fish mortality are associated with in-water works as a result of increases in suspended sediment and as a result of fish rescue activities. Mitigation measures described in Section 6.5.1.9.4 (page 183 to 184) are intended to reduce the risk of fish mortality. It is anticipated that there will be a low risk of fish mortality as a result of the Project.	It is anticipated that with the implementation of effective mitigation measures, fish mortality risk will be low. Additionally, unanticipated fish mortalities as a result of the Project are not anticipated to result in impacts that will affect productivity of Commercial, Recreational, or Aboriginal, fisheries.
		<ul style="list-style-type: none">Water quality measurements will be compared to the Provincial Water Quality Monitoring Network baseline data and Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of aquatic life (CCME 2002)	Please refer to the discussion presented below in relation to the "Change in Water Quality" Potential Environmental Effect.	Please refer to the discussion presented below in relation to the "Change in Water Quality" Potential Environmental Effect.	Please refer to the discussion presented below in relation to the "Change in Water Quality" Potential Environmental Effect.
Change in water quality	Change in water quality parameters Change in sediment	<ul style="list-style-type: none">DO, temperature turbidity and Provincial Water Quality Objectives (PWQOs)/ or CCME	The following applies to all phases of the Project: Provincial Water Quality Monitoring Network (PWQMN) baseline characteristics were used to	Section 6.2.1.3 (page 70 to 74) of the Milton Logistics Hub, Hydrology and Surface Water Quality Technical Data Report (Appendix E.15) indicates that there will be an overall	It is anticipated that the Project will result in positive effects to fish and fish habitat through decreases in anthropogenic sediment and nutrient levels, decreases in

Potential Environmental Effect (EIS Table 6.9, page 169)	Effect Pathway (EIS Table 6.9, page 169)	Measurable Parameter(s) and Units of Measurement (EIS Table 6.9, page 169)	Quantitative Description of Existing Environmental Conditions	Description of how the Project is expected to result in changes to the measureable parameter	Discussion of Implications of these changes to Fish and Fish Habitat
	load and quality	targets	<p>characterize baseline water quality and sediment quality within PDA watercourse reaches. Baseline water quality data and sediment quality data are included in Tables 4.5 (page 19) and 4.6 (page 23) (respectively) of the Milton Logistics Hub, Hydrology and Surface Water Quality Technical Data Report (Appendix E.15) and are discussed in Sections 4.3.4.1 (page 21 to 22) and 4.3.5 (page 22 to 26) of that report. Further discussion is provided related to relevant water quality guidelines in Section 4.2.2 (page 15 to 16) of the Milton Logistics Hub, Fish and Fish Habitat Technical Data Report (Appendix E.4).</p> <p>Baseline water quality data are presented in the following Milton Logistics Hub, Technical Data Reports:</p> <p>Channel Realignment (Appendix E.2)</p> <ul style="list-style-type: none">Sections 6.1.3.9 (page 23 to 24) and 6.2.3.9 (page 45) <p>Fish and Fish Habitat (Appendix E.4)</p> <ul style="list-style-type: none">Table 5.2 (page 28) and Section 5.1.4 (page 30 to 32) <p>Hydrology and Surface Water Quality (Appendix E.15).</p> <ul style="list-style-type: none">Sections 5.6.1 (page 54 to 58) and 5.6.2 (page 58 to 60)	improvement in water and sediment quality, with reductions in sediment and phosphorous loading, the potential for decreases in thermal impacts (resulting from an increase in shade from riparian planting), and a potential increase in dissolved oxygen concentrations resulting from the potential decrease in thermal impacts. Additionally, channel realignment and enhancement is intended to reduce erosion and erosion potential at several locations within the PDA.	erosion rates and potentials, moderation of water temperatures, and increases in dissolved oxygen concentrations.

ATTACHMENT IR23 – SUPPLEMENTAL MITIGATION MEASURES

SUPPLEMENTAL MITIGATION MEASURES

Appendix G of the EIS provides a complete list of the mitigation measures, follow-up monitoring and program commitments that CN will implement through the construction and operation of the Project to address potential effects on VCs. The list below is a compilation of the additional or more detailed mitigation measures from Table 7.1 in the EIS and the various Technical Data Reports (TDRs) (EIS Appendix E) that will be implemented, as appropriate.

These mitigation measures, along with additional relevant mitigation measures identified during the EA process and through discussions with regulators, will be considered and refined prior to construction. Appropriate best management practices and standard mitigation measures will be incorporated, as appropriate.

Supplemental Mitigation Measures for Consideration during Detailed Design

Air Quality Recommendations
A BMP plan for the construction phase should be developed and implemented. (Appendix E.1, page 91)
Temporary barriers might be considered to prevent soil erosion and control wind flow during construction phases for locations where potential dust could be generated. (Appendix E.1, page 91)
Construction: Fugitive dust emissions can be further reduced by chemical stabilization for semi-permanent or relatively long-term unpaved roads or parking lots. (Appendix E.1, page 91)
Construction: Temporary access routes and parking lots within the site can be constructed to reduce emissions. A gravel roadway and parking lot would reduce PM emissions relative to travelling over soil. (Appendix E.1, page 91)
Construction: Stabilized construction access and roadways could reduce the tracking of construction sediment (mud and dirt) onto public roads by construction equipment. (Appendix E.1, page 91)
Construction: A no idling policy could be introduced to control mobile equipment and other vehicle emissions where applicable. (Appendix E.1, page 91)
<p>Construction: Dust mitigation for the temporary portable concrete plant:</p> <ul style="list-style-type: none"> • Proper planning, design and construction of the portable concrete plant should be implemented. The plant should be located away from residential areas. Excess material storage areas should be avoided. • Consideration of installation of temporary berms/barriers around the concrete plant equipment (mixing, silos, transferring and storage areas) is suggested to prevent dust emissions. • Dust control equipment (e.g., fabric filter or suitable dust collector systems) may be considered for dry material transferring and handling. • Material transfer points, conveyors and mixing equipment should be adequately covered or enclosed to eliminate fugitive dust emission. • Movable and telescoping chutes may be considered for truck loading activities. The drop height of the cement/ aggregate mixture into the truck shall be minimized to minimize the visible emissions. <p>(Appendix E.1, page 91-92)</p>
Operations: A no idling policy would be applied to reduce mobile equipment and other use vehicle

Supplemental Mitigation Measures for Consideration during Detailed Design

emissions where possible and appropriate. (Appendix E.1, page 92)
Operations: SmartStart equipped locomotives should be used as much as possible to reduce excessive idling during warm months. (Appendix E.1, page 92)
Operations: Non-road mobile and stationary equipment equipped with low emissions and high fuel combustion efficiency engines should be used. (Appendix E.1, page 92)
Operations: Streamline and further improve (if applicable) the operation process so that the out-going trucks could travel less distance on-site and expedite the container handling turnaround time. (Appendix E.1, page 92)
Operations: Vacuum sweeping and water flushing of the on-site roads should be applied when necessary to remove the loose material present on the surface of roads that could be re-suspended by road traffic. (Appendix E.1, page 92)
Access and onsite roads will be watered as required to control fugitive dust emissions. (EIS, Table 7.1, page 317)
Noise and Vibration Recommendations
Berms/barriers and trees are recommended for areas close to Lower Base Line Road, both to the east and west of the Terminal. Stantec's estimation indicates that the required minimum height for a berm, barrier or combination of berm and barrier is 5 m. (Appendix E.10, page 38)
Suggested during Operations: Enforce speed limits (for truck traffic) within the Terminal area to reduce the intensity of impulsive noise. (Appendix E.10, page 39)
Suggested during Operations: Train/instruct CN employees that operate container handling machines (e.g. reach stacker operators) to avoid excessive impulsive noise during their loading and unloading operations. (Appendix E.10, page 39)
CN has committed to a communication protocol where the local community will be kept informed of planned construction activity (for example, a website will be set up, newspapers ads will be placed, nearby residents will be notified by mail, and there will be dedicated ways to contact CN including an information centre, 1-800 phone line, email address and website). (Appendix E.10, page 63)
In case of a complaint during construction, CN will investigate expeditiously and take appropriate action to ensure that the issue is managed responsibly. (Appendix E.10, page 63)
Limiting the overall sound power level of generators used for construction activity to 107 dBA for each individual unit. (Appendix E.10, page 63)
Implementation of a temporary sound barrier around the concrete batch plant for Phase 3 paving operations. (Appendix E.10, page 63)
Construction equipment will be turned off when not in use (i.e. a no idling policy). (Appendix E.10, page 63)
Recommended during construction: On-site vehicle traffic will be restricted to approved access routes to and from the Project site area. (Appendix E.10, page 63)

Supplemental Mitigation Measures for Consideration during Detailed Design

<p>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 should be considered. A noise monitoring protocol should be developed prior to major construction. (Appendix E.10, page 65)</p>
<p>It is recommended that once the Milton Logistics Hub is operational, an acoustic audit be conducted to verify compliance with the criteria outlined in this report. The audit will confirm the as built mitigation measures, operation scenarios, and administrative controls applied to the Project. This study would also establish the actual sound levels emitted from the Project's operation. If the audit shows that the change in the acoustical environment is acceptable (i.e. does not meet the criteria discussed within this report), a noise abatement action plan should be developed outlining a plan of action and the required time to operate the Terminal in compliance with the criteria discussed within this report. (Appendix E.10, page 65)</p>
<p>When construction of the Project begins in the area, it is recommended that vibration monitoring be conducted at selected locations within the CN property boundary for the first four (4) weeks of the construction period. If monitoring results raise particular concerns, further investigation and continuous monitoring may be required. If the vibration levels are within the limits discussed in this report, a periodical or complaint based monitoring program shall be considered. A vibration monitoring protocol should be developed prior to major construction activities. (Appendix E.18, page 30)</p>
<p>It is recommended that once the Milton Logistics Hub is operational, a vibration audit be conducted to verify that the vibration from railway activity in the area where changes in rail infrastructure occurred (i.e. Rail realignment area) does not exceed those measured at various setbacks. If post-Project levels exceed the pre-Project levels; further investigation would be required to confirm that the vibration at PORs meet the criteria discussed within this report. (Appendix E.18, page 29)</p>
<p>As detailed site plans are not yet finalized for the future development north of Britannia Road, it is recommended that CN request a noise and vibration assessment respecting CN's criteria for development in proximity to railways. These criteria were implemented in the existing subdivision near (Derry Road), and are consistent with the best practices set forth in the Railway Association of Canada/Federation of Canadian Municipalities Proximity Guidelines. (Appendix E.18, page 29)</p>
<p>The Town of Milton typically includes as a condition of approval requirements respecting barriers; brick veneer or masonry building façade for the first row of houses near a rail line; and, a clause informing the future residence on the presence of the rail line near their dwellings and their right of expansion. However, it is recommended that CN also discuss with Town and future developer the importance of the above conditions. (Appendix E.18, page 29)</p>
<p>Light Recommendations</p>
<p>The majority of that night work will occur after shading elements such as the berm are constructed which would mitigate the effects of temporary lighting during these overnight operations.</p> <p>Since it is planned to complete paving operations after the berms are constructed, the off-property light effect will be mitigated by the berms. (Appendix E.8, page 2 and 15)</p>
<p>Groundwater Recommendations</p>
<p>Typically, the most common mitigation measure that can be employed is the installation of anti-seepage collars in trenches to prevent the preferential movement of groundwater along the servicing alignments</p>

Supplemental Mitigation Measures for Consideration during Detailed Design

and, subsequently, maintain pre-construction groundwater flow patterns. (Appendix E.6, page 24)
<p>A groundwater dewatering assessment should be completed following preliminary design, to estimate project dewatering needs. Should construction dewatering volumes be projected in excess of 50,000 L/day, the following mitigation measures should be considered:</p> <ul style="list-style-type: none"> • Groundwater Discharge Management – Establishment of an appropriate dewatering system that will dissipate the energy and reduce the sediment content of discharging water for the purpose of limiting potential erosion effects. Common measures include the use of sediment control basins, erosion pads, geotextile filter bags and the positioning of straw bale/filter cloth barriers downgradient of the discharge point. • Private Well Monitoring – During construction, monitoring of private wells expected to be located within the dewatering cone of depression (as estimated from the dewatering assessment) for drawdown interference, which could potentially affect the operation of private wells with regards to water quantities. The providing of affected well owners with temporary potable water supplies or reducing construction dewatering rates and/or duration would be required if notable interference effects were observed. (Appendix E.6, page 25)
Surface Water Recommendations
Develop water quality monitoring plans to monitor for sediment release events during in-water construction activities and implement corrective actions. Corrective actions are not successful, construction activities will be temporarily suspended until effective solutions are identified. (EIS, Table 7.1, page 312)
Riparian vegetation establishment will be assessed by a terrestrial biologist with experience in post-construction monitoring. Monitoring should occur in the first spring and fall following completion of construction, followed by a single fall visit in the following monitoring years. A yearly post-construction monitoring report will be prepared and will include monitoring methods, successes and deficiencies of the items listed above, recommendations for remedial action, and a photographic record of conditions observed during monitoring. Deficient, dead, or dying plant material will be replaced by the contractor at the one year inspection and if necessary over the remaining period. (Appendix E.2, page 56)
Based on the warmwater characteristics of the channel through the Project site, in-stream construction will only be permitted between July 1 and March 14 unless otherwise negotiated with DFO. Offline channel construction is not restricted by this timing window. (Appendix E.2, page 51)
<p>Inspection and monitoring of erosion and sediment control (ESC) measures:</p> <ul style="list-style-type: none"> • Inspections of ESC measures will be undertaken by a qualified inspector or professional engineer. • Regular inspections of ESC measures will be undertaken throughout all stages of construction until all disturbed areas have naturally stabilized and will occur at the following frequencies: <ul style="list-style-type: none"> – on a daily basis – before and after every significant rainfall event – daily during extended rain periods; and, – all damaged or ineffectively functioning ESC measures will be repaired and/or replaced within 24 hours of the inspection. (Appendix E.2, page 52)
Should dewatering of the excavated area be required (due to rain or minor amounts of groundwater), any water pumped from the excavated area will be pumped through a filter bag or into an area of

Supplemental Mitigation Measures for Consideration during Detailed Design

undisturbed vegetation at least 30 meters from the watercourse or an alternate area approved by the engineer/fisheries biologist. (Appendix E.2, page 52)
Minimize the construction footprint (i.e., PDA) to the extent possible. (Appendix E.15, page 74)
Minimize drainage interactions and alterations. (Appendix E.15, page 74)
Manage surface run-off and drainage with construction of diversion ditches, culverts and SWM ponds. Size drainage ditches, culverts and SWM ponds appropriately. (Appendix E.15, page 74-75)
Permanent SWM ponds will be built during first stage of the construction phase to manage construction site surface run-off and drainage. The SWM ponds will be at a minimum designed for a 100 year return period event. (Appendix E.15, page 75)
Implement sediment control measures (e.g., silt fences) to prevent sediment from entering adjacent watercourses. (Appendix E.15, page 75)
Implement fugitive dust suppression programs. (Appendix E.15, page 75)
Channel realignment works will predominantly be constructed outside of the existing channels and will be commissioned upon completion of all works to minimize the time period for diversion of flows within the existing channel. (Appendix E.15, page 75)
<p>The following are the key features of the Stormwater Management Strategy:</p> <ul style="list-style-type: none"> • diversion of Tributary A for the Regional event around the PDA and into Indian Creek via interception with a perimeter ditch; • two SWM ponds that contain and attenuate flows up to 1:100 year storm event; • a minimum of 0.6 m of pond freeboard during the 1:100 year storm event; • low flow orifice outlets in the ponds for the 25 mm return period storm event that release the detention volumes over an approximately 12 day period in order to mitigate against receiving water erosion; • channel realignment plantings and live stakes within the banks and riparian areas and instream features (i.e., woody debris toe protection) to provide shading for watercourse channels; • TSS and total phosphorus removal rates for the SWM ponds of 80 and 70%, respectively; and, • winter road salt mitigation measures to be implemented to reduce salt run-off. (Appendix E.15, page 75)

Supplemental Mitigation Measures for Consideration during Detailed Design

A stormwater management strategy has been developed to mitigate these potential impacts as summarized below:

- Culverts – Three culverts are proposed to convey the storm runoff across the railway tracks and proposed yard. The proposed culverts will replace the existing culverts between Britannia Road and Lower Baseline;
- Flow diversion channel – A flow diversion channel is proposed along the northeast side of the railway tracks to capture and convey storm flows from Tributary A (greater than the 100-year storm event);
- Storm sewer network – A storm sewer network is proposed to collect and convey the storm runoff from the yard, administration and maintenance buildings and gate area for events up to and including the 5-year storm event;
- Drainage swales – Drainage swales are proposed along the southwestern side of the yard to collect, store, treat and convey storm runoff from the yard to the wet ponds;
- Oil Grit Separator (OGS) units – Two OGS units are proposed for the administration and maintenance buildings and gate area to capture sediments, oil and grease before discharge to the wet ponds;
- Wet ponds – Two wet ponds are proposed to store, treat and gradually release the storm runoff into Indian Creek. The ponds will consist of permanent pools, sediment forebays, controlled outlets and overflow spillways which will provide required quality, erosion and flood controls; and,
- Rainwater harvesting system – A rainwater collection and distribution system is proposed to collect rainwater from administration and maintenance buildings and distribute it for the irrigation of landscaped areas and washing of equipment. (Appendix E.15, Appendix B, page 22)

To mitigate thermal impacts, a combination of various measures may be considered during the detailed design stage including but not limited to:

- Plantation along the wet ponds and outlet channel to provide dense shading;
- Reverse bottom draw outlet pipe with installation of cooling towers/cooling trenches;
- Vegetated berms. (Appendix E.15, Appendix B, page 10)

Vegetation and Soils Recommendations

CN will follow the proper screening and disposal requirements for excess soils if any is deemed to require off-site disposal. (Appendix E.13, page 13)

When soils suspected of being potentially contaminated are observed during construction, additional testing should be conducted to further characterize these types of soils to determine suitability for re-use on-site. (Appendix E.13, page 13)

Migratory Birds Recommendations

Should vegetation clearing activities be unavoidable during this window, conduct nest sweeps and avoidance of clearing during key sensitive periods and in key locations. (EIS, Table 7.1, page 313)

Natural vegetation along the boundaries of the Project will be retained to provide noise buffers. (EIS, Table 7.1, page 314)

Implement BMPs including locating vegetation or greenery away from glass to minimize risk of avian collision with windows, (refer to the Bird Friendly Development Guidelines, City of Toronto 2007). (EIS, Table 7.1, page 314)

Supplemental Mitigation Measures for Consideration during Detailed Design

<p>Project layout will be designed to avoid effects on natural features, including:</p> <ul style="list-style-type: none"> • Trafalgar Moraine Earth Science ANSI; • North Oakville-Milton West Wetland Complex; and, • Protected Countryside land use designation under the Greenbelt Plan. (EIS, Table 7.1, page 314)
Fish and Fish Habitat Recommendations
Maintain downstream flow at all times when conducting in-water construction activities. (EIS, Table 7.1, page 311)
When implementing erosion and sediment control mitigation is not practicable (e.g., due to weather conditions), reduce the number of vehicles on access roads or cleared work areas to limit erosion risks. (EIS, Table 7.1, page 312)
For dewatering activities, pump water onto stable, well vegetated areas, tarpaulins, sheeting, rocks, sand bags, or into settling ponds, filter bags, or other appropriate sediment filtering devices, as determined by the Environmental Monitor(s) or the mitigation plan. (EIS, Table 7.1, page 313)
Species at Risk Recommendations
Avoid construction in-water during Snapping Turtles overwintering period from October to April. (EIS, Table 7.1, page 315)
Implement turtle habitat enhancements in Indian Creek and onsite ponds. (EIS, Table 7.1, page 316)
Retain natural vegetation along the boundaries of the Project to provide noise buffers and to limit noise associated with clearing. (EIS, Table 7.1, page 316)
Maintain construction and operations equipment in good order (e.g., mufflers). (EIS, Table 7.1, page 316)
Where permissible under safety and navigation requirements, outdoor lights will be shielded to minimize light spillage beyond the required areas. (EIS, Table 7.1, page 316)
Socio-economic Conditions Recommendations
<p>On all sections of Britannia Road and Tremaine Road, including those that are anticipated to experience the considerable change, it is anticipated that reasonable and conventional measures can be implemented to mitigate the changes in roadway operating conditions resulting from the addition of Terminal-generated heavy-truck traffic. Such measures may include:</p> <ul style="list-style-type: none"> • Adjustment to traffic signal control timing and phasing plans; • Provision of advisory and/or regulatory signage; • Adjustments to the lengths of left turn lanes for added vehicular queue storage length; • Addition of auxiliary right turn lanes or left turn lanes; and • Provisions to accommodate and address the safety of pedestrians and cyclists . (Appendix E.17, page 24)

Supplemental Mitigation Measures for Consideration during Detailed Design

Archaeology and Heritage Resources Recommendations
<p>Artifact yields from test units may require mitigation of impacts in accordance with Section 3.4.1 and/or Section 3.4.2 of the MTCS' 2011 Standards and Guidelines for Consultant Archaeologists. (Appendix E.14, Table 137, page 227)</p>
<p>In order to reduce the potential for indirect effects as a result of vibration from Project activities, construction activities are to be avoided within 50 m of the barn structure contained within CHR-1 and the residence and barn structures contained within CHR-4. A buffer zone of 50 m will be used to isolate the resources from Project construction activities. Where Project activities must occur within the 50 m buffer, maximum acceptable vibration, or PPV, levels should be determined by a qualified engineer prior to Project activities. Project construction activities should be monitored to confirm that maximum PPV levels are not exceeded. (Appendix E.3, page 31)</p>
<p>Follow MTCS suggested methods to minimize or avoid negative direct or indirect effects including (Government of Ontario 2006), but not limited to:</p> <ul style="list-style-type: none"> • Alternative development approaches; • Isolating development and site alteration from significant built and natural features and vistas; • Design guidelines that harmonize mass, setback, setting, and materials; • Limiting height and density; • Allowing only compatible infill and additions; • Reversible alterations; and, • Buffer zones, resource protection measures, and other planning mechanisms. (EIS, Table 7.1, page 319)
<p>Implement a worker education program about appropriate protocols in case of accidental discoveries. (EIS, Table 7.1, page 318)</p>
<p>Train key construction staff in the recognition of basic archaeological artifacts such as Aboriginal material culture (e.g., clay ceramics, lithic artifacts, and faunal remains), and Euro-Canadian material culture (e.g., refined ceramics, glassware, construction debris, and personal effects). (EIS, Table 7.1, page 319)</p>
<p>Conduct further assessment of changes to the PDA. (EIS, Table 7.1, page 317)</p>

ATTACHMENT IR25 – SUPPLEMENTAL PROJECT INFORMATION FOR CUMULATIVE ENVIRONMENTAL EFFECTS

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
Residential Development	Bristol Planning District	The Bristol Survey Secondary Plan Area is located within the Town of Milton Urban Expansion Area and is bounded by Highway 401 to the north, James Snow Parkway to the east, Derry and Britannia Roads to the south and Regional Road 25, Derry Road and Thompson Road to the west.	<div>-Change in fish mortality (construction phase).</div> <div>-Degradation of the Indian Creek and tributaries water quality (construction phase).</div> <div>-Change in Migratory Bird Use of the Area (construction phase).</div> <div>-Direct mortality of SAR (construction and operation phase).</div> <div>Change to Critical Habitat for SAR (construction phase).</div> <div>-Quality and quantity of land and resource use (construction and operation phase).</div>	Operational	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to fish mortality and the degradation of the Indian Creek and tributaries water quality.	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to a loss of suitable habitat and possible displacement of bird use to other areas within or outside of the RAA.	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to direct mortality and a loss of suitable habitat of SAR use to other areas within or outside of the RAA.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to quality and quantity of land and resource use.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
	Sherwood Planning District	The Sherwood Survey Secondary Plan Area is located within the Town of Milton Urban Expansion Area and is bounded by Highway 401 to the north, Peru Road, Canadian Pacific Railway Company (CP), CN and Regional Road 25 to the east; Louis St. Laurent Avenue to the south and Tremaine Road to the west.	<div>-Change in fish mortality(constru ction phase)</div> <div>-Degradation of the Indian Creek and tributaries water quality (construction phase).</div> <div>-Change in Migratory Bird Use of the Area (construction phase).</div> <div>-Direct mortality of SAR (construction phase).</div> <div>-Change in Critical habitat for SAR (construction phase).</div> <div>-Quality and quantity of land and resource use (construction and operation phase).</div>	Operational	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to the degradation of the Indian Creek and tributaries water quality.	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to a loss of suitable habitat and possible displacement of bird use to other areas within or outside of the RAA.	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to direct mortality and a loss of suitable habitat of SAR use to other areas within or outside of the RAA.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to quality and quantity of land and resource use.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
	Boyne Planning District	The Boyne Survey Secondary Plan Area is located within the Town of Milton Urban Expansion Area and is being implemented to accommodate growth to the year 2021. Once fully developed, the Boyne Secondary Plan Area will likely accommodate an additional 50,000 residents. The area is approximately 930 ha in size and is bounded by Louis St. Laurent Avenue to the north, James Snow Parkway to the east, Britannia Road to the south and Tremaine Road to the west.	<div>-Change in fish mortality (construction phase).</div> <div>-Degradation of the Indian Creek and tributaries water quality. (construction phase).</div> <div>-Direct migratory bird mortality, Change in Migratory Bird Use of the Area (construction phase).</div> <div>-Sensory disturbance (construction and operation phase).</div> <div>-Direct mortality of SAR and change to critical habitat for SAR (construction phase).</div>	Pending approval	Included in the assessment as the area outlined for this development will overlap with the Project LAA both spatially and temporally (construction phase only, as residual effects are restricted to the construction phase of the Milton Logistics Hub project and no residual effects are expected during operations of the Terminal on fish and fish habitat) for the residual effects on fish and fish habitat including change in fish mortality and degradation of Indian Creek and tributaries water quality.	Included in the assessment as the area outlined for this development will overlap the Project LAA both spatially and temporally. Potential cumulative environmental effects include direct migratory bird mortality, change in migratory bird use of the area and sensory disturbance.	Included in the assessment as the area outlined for this development will overlap the Project RAA both spatially and temporally and may result in a cumulative environmental effect related to direct mortality of SAR and change to critical habitat for SAR.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment as development may contribute cumulatively to quality and quantity of land and resource use with the Project.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
Road Development /Upgrades	Louis St. Laurent Avenue, Tremaine Road to Yates Boulevard	Louis St. Laurent Avenue is an important roadway that connects east and west Milton. This essential corridor will also provide residents in residential growth areas with more direct access to major 400-series highways and intersect all three residential growth areas (Bristol, Sherwood and Boyne). The roadway was designed as a four-lane thoroughfare with a centre median.	-Change in fish mortality (construction phase). -Degradation of the Indian Creek and tributaries water quality. (construction phase). -Change in Migratory Bird Use of the Area (construction phase). -Direct mortality and a loss of suitable habitat of SAR use (construction phase). -Quality and quantity of land and resource use (construction and operation phase).	Operational	Included in assessment and grouped together with other operational linear infrastructure that may have contributed to fish mortality and the degradation of the Indian Creek and tributaries water quality.	Included in assessment and grouped together with other operational residential and Infrastructure development that may have contributed to a loss of suitable habitat and possible displacement of bird use to other areas within or outside of the RAA.	Included in assessment and grouped together with other operational residential and Infrastructure development that may have contributed to direct mortality and a loss of suitable habitat of SAR use to other areas within or outside of the RAA.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment and grouped together with other operational residential and Infrastructure development that may have contributed to quality and quantity of land and resource use.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.
	Main Street Grade Separation	The project involved the construction of an underpass on the south side of the existing CP track level crossing at Main Street East, just east of Ontario Street. The purpose of this underpass was to improve traffic flow on Main Street and allow for better access to the business areas of Milton as commercial development grows on Main Street.	None	Operational	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project for the overlap on any creeks or tributaries in the RAA.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project for the overlap on any residual environmental effects for migratory birds in the RAA.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project for the overlap on any residual environmental effects for SAR in the RAA.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no temporal overlap with the Project and is therefore not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
	Main Street West, Tremaine Road to Bronte Street	Main Street West is a rural roadway that has been designed as a four-lane thoroughfare with a centre median. This street is being widened to support future growth within the community.	-Change in fish mortality (construction phase). -Degradation of the Indian Creek and tributaries water quality. (construction phase).	Under construction	Included in the assessment and grouped together with other operational linear infrastructure projects that may have contributed to fish mortality and the degradation of the Indian Creek and tributaries water quality.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project that overlapped on any residual environmental effects for migratory birds in the RAA. There is also no overlap for the temporal boundaries for the Project.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project that overlapped on any residual environmental effects for SAR in the RAA. There is also no overlap for the temporal boundaries for the Project.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no temporal overlap with the Project and is therefore not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.
	Britannia Road Transportation Corridor Improvements	The Halton Region is currently planning to construct a six lane road configuration on Britannia Road from Tremaine Road to Regional Road 25, ultimately from Regional Road 25 to Highway 407, to accommodate travel demands within the Town of Milton. As a result, a grade separation is planned by the Region for the CN Britannia road crossing west of Tremaine Road.	-Change in fish mortality (construction phase). -Direct migratory bird mortality Change in Migratory Bird Use of the Area (construction phase). -Direct SAR mortality and a change of critical habitat for SAR (construction phase).	Pending Approval	Included in the assessment as the area outlined for this development will overlap the Project LAA both spatially and temporally (construction phase only) and residual effects from a change of fish mortality area may occur.	Included in the assessment as the area outlined for this development will overlap the Project LAA both spatially and temporally and has the potential for direct migratory bird mortality and a change of migratory bird use of area.	Included in the assessment as the area outlined for this development will overlap the Project LAA both spatially and temporally and has the potential for direct SAR mortality and a change of critical habitat for SAR.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no temporal overlap with the Project and are anticipated to not have overlapping effects (EIS Section 6.6.1.5.1, page 284-286).	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
	Tremaine Road, Derry Road to Britannia Road	Halton Region is currently constructing a six lane road configuration on Tremaine Road from Derry Road to Britannia Road to accommodate travel demands within the Town of Milton.	None	Operational (anticipated to be complete by end of 2015).	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project that overlapped on any residual environmental effects for migratory birds in the RAA. There is also no overlap for the temporal boundaries for the Project.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project that overlapped on any residual environmental effects for migratory birds in the RAA. There is also no overlap for the temporal boundaries for the Project.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no temporal overlap with the Project and is therefore not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.
	Urban and Rural Road upgrades	Various roads within the Town of Milton and Halton Region have been included in the 10 year planning documents.	-Quality and quantity of land and resource use (construction and operation phase).	Planned for 2025	Not included in the evaluation of cumulative effects assessment as the temporal boundaries are not expected to overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project that overlapped on any residual environmental effects for migratory birds in the RAA. There is also no overlap for the temporal boundaries for the Project.	Not included in the evaluation of cumulative effects assessment as there was no expected residual environmental effects for this project that overlapped on any residual environmental effects for migratory birds in the RAA. There is also no overlap for the temporal boundaries for the Project.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment and grouped together with other operational residential and Infrastructure developments that may contribute to quality and quantity of land and resource use.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

Revised Table 6.2: Present, Approved and Proposed Projects and Activities Considered In the Environmental Assessment for the Purpose of Evaluating Cumulative Environmental Effects

Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
Infrastructure Development	Halton Region Waste Management Site	To support the growth of Halton Region, the Regional Municipality of Halton operates the Halton Region Waste Management Site providing the region with solutions for reduce, reuse, recycle, yard waste composting, safe disposal of household hazardous waste and garbage disposal.	-Change in fish mortality (construction phase). -Degradation of the Indian Creek and tributaries water quality (construction phase). -All residual environmental effects for Migratory Birds (construction phase). -All residual environmental effects for SAR (construction phase). -Quality and quantity of land and resource use (construction and operation phase).	Operational	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to the degradation of the Indian Creek and tributaries water quality.	Included in assessment and grouped together with other operational residential and Infrastructure developments that may contribute cumulatively to all residual environmental effects for Migratory Birds.	Included in assessment and grouped together with other operational residential and Infrastructure developments that may contribute cumulatively to all residual environmental effects for SAR.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment and grouped together with other operational residential and Infrastructure developments that may have contributed to quality and quantity of land and resource use.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.
Utilities	Hydro One Bruce to Milton Transmission Reinforcement Project	The Bruce to Milton Transmission Reinforcement Project was one of several Hydro One Networks Inc. (Hydro One) projects completed to meet Ontario's electricity delivery needs in the 21 st Century. An approximately 180 km double-circuit 500 kilovolt (kV) transmission line was built on a widened existing transmission corridor connecting the Bruce Power Facility in Kincardine to Hydro One's switching Station in Milton. The transmission line route crosses through five upper tier municipalities (Bruce, Grey, Dufferin, and Wellington Counties and the Regional Municipality of Halton) and eleven lower tier municipalities (Kincardine, Brockton, Hanover, West Grey, Southgate, Wellington North, East Garafraxa, Erin, Halton Hills and Milton).	None	Operational	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no spatial or temporal overlap with the Project and is therefore not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

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					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
	Union Gas Hamilton-Milton (Dawn Parkway System Expansion) Project	In order to expand its natural gas pipeline system, Union Gas is proposing to construct and operate a 48" diameter steel natural gas pipeline approximately 20 km in length from Hamilton to Milton. More specifically, the pipeline is proposed to travel between the existing Union Gas Hamilton Valve Site located near Highway 6 and Carlisle Road and the existing Union Gas Milton Gate Station located south of Derry Road between Ontario Street and Third Line.	-Change in fish mortality (construction phase). -Direct Migratory Bird Mortality (construction phase). -Direct mortality of SAR (construction phase).	Approved project, not under construction	Included in the assessment as the area outlined for this development will overlap the Project LAA both spatially and temporally (construction phase only) and residual effects from a change of fish mortality area may occur.	Included in the assessment for Direct Migratory Bird Mortality as development will overlap the Project temporally and could result in cumulative effects.	Included in the assessment as the area outlined for this development will overlap the Project RAA both spatially and temporally and may result in a cumulative environmental effect related to direct mortality of SAR.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no spatial or temporal overlap with the Project and is therefore not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.
	Union Gas Burlington-Oakville (Dawn Parkway System Expansion) Project	In order to expand its natural gas pipeline system, Union Gas is proposing to construct and operate a 20" diameter steel natural gas pipeline approximately 12 km in length from Burlington to Oakville. More specifically, the pipeline is proposed to travel between the Parkway West Compressor Station (currently under construction) located near the intersection of Eighth Line and Derry Road in the Town of Milton and the existing Union Gas Bronte Gate Station located East of Ninth Line, south of Dundas Street in the Town of Oakville.	None	Pending approval	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no spatial or temporal overlap with the Project and is therefore not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.
	Union Gas Parkway West Project	Union Gas is building a new compressor facility known as Parkway West on the east side of Eighth Line, southeast of Derry Road East and southwest of Highway 407 near the existing Union Gas Parkway site in the Town of Milton. This new facility will house two natural gas compressors, Parkway C and Parkway D. When in operation, the Parkway C Compressor will provide back-up compression in case of an unplanned compressor outage and Parkway D will provide additional compression to support the growing demand for natural gas at the existing station. This project is necessary to enhance the reliability and security of gas supply to the Greater Toronto and Hamilton Area and markets beyond.	None	Under construction	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Not included in the evaluation of cumulative effects assessment as there is no spatial overlap on the VC RAA for the Project.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Not included in the evaluation of cumulative effects assessment as there is no spatial or temporal overlap with the Project and is not anticipated to have overlapping effects.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

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Past, Present and Future Physical Activities	Project or Activity Name	Project or Activity Description	Environmental Effects Likely to Interact with Project Residual Effects	Current Status	Rationale for Project Consideration in Cumulative Effects Assessment					
					Fish and Fish Habitat	Migratory Birds	Species at Risk	Human Health	Socio-Economic Conditions	Archaeological and Heritage Resources
Agricultural Conversion	General Agricultural Conversion and Land Use of the Area	Historic conversion of native land to agricultural land use throughout history of development in the RAA. Conversion from agricultural land use to residential or commercial land use.	<div>-Change in fish mortality(construction phase)</div> <div>-Degradation of the water quality through introduction of deleterious material within Indian Creek and tributaries to Indian Creek (construction phase).</div> <div>-Change in Migratory Bird Use of the Area (construction and operation phase).</div> <div>-Direct mortality for SAR and change to critical habitat for SAR (construction phase).</div> <div>-Quality and quantity of land and resource use with the Project (construction and operation phase).</div>	Operational	Included in the assessment as Agricultural conversion and Land use have contributed to the degradation of the water quality through introduction of deleterious material within Indian Creek and tributaries to Indian Creek and potential fish mortality within the RAA.	Included in assessment as Agricultural conversion and land use may contribute cumulatively to a change in Migratory Bird Use of the Area.	Included in assessment as Agricultural conversion and land use may contribute cumulatively to a direct mortality for SAR and change to critical habitat for SAR.	Excluded from the assessment given that residual Project effects are likely to be negligible with respect to a change in human health. (EIS Section 6.6.1.4.1, page 283).	Included in assessment as Agricultural conversion and land use may contribute cumulatively to quality and quantity of land and resource use with the Project.	Excluded from the assessment. No residual Project effects are likely when standard archaeological and cultural heritage mitigation implemented.

KEY

- Operational – Project construction completed
- Pending Approval – Project construction pending agency approval
- Approved project, not under construction – approval for construction granted by agencies
- Under Construction – Project construction occurring at time of EIS preparation