

New Track and Facilities Transit Project Assessment Process

Final Environmental Project Report – Chapter 9

05-Mar-2021

Prepared by:



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Authorization

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9 Commitments & Future Work

9.1 Implementation of Mitigation & Monitoring Measures

This section is to be read in conjunction with Chapters 5, 6, and 7 of this Environmental Project Report (EPR).

To ensure that potential adverse environmental effects associated with the New Track & Facilities Project are avoided or mitigated to the extent possible, the following actions will be adhered to by Metrolinx during the subsequent phases of the project:

- Implement all mitigation & monitoring measures as documented in Chapters 5, 6, and 7 of this EPR during the detailed design, construction and operational phases of the project;
- Ensure that all mitigation & monitoring measures outlined in this EPR and all commitments outlined in Chapter 9 of this EPR are captured in the Contract Documents for implementation by Metrolinx and/or their Contractor, as appropriate; and
- Undertake all additional studies/work as outlined in this EPR prior to implementation of the undertaking.

9.2 Environmental Management System

Prior to construction and implementation of the Project, an Environmental Management System (EMS) will be established and implemented to ensure that environmental protection/mitigation measures identified through the New Track & Facilities TPAP are fulfilled and functioning as expected. The overall intent of the EMS will be to integrate environmental management into the daily operations and other quality management systems of the project.

Specifically, an EMS that conforms to ISO 14001:15 – Environmental Management Systems – Requirements with guidance for use (“ISO 14001”) will be established. The EMS will ensure and serve as a mechanism for performance evaluation, including:

- i. the methods for monitoring, measurement, analysis and evaluation;
- ii. the criteria against which environmental performance is measured;
- iii. the timing for performance of monitoring and measuring; and
- iv. the timing for analysis and evaluation of the results from monitoring and measuring.

9.3 Permits, Licenses and Approvals

In addition to carrying out the TPAP and satisfying the requirements of *O. Reg. 231/08* (made under the *Environmental Assessment Act*), there are also a number of other federal, provincial, municipal, and other approvals/permits that will be required to implement the New Track & Facilities Project. The following section summarizes the preliminary list of permits and approvals that are anticipated to be required. Metrolinx (or their Contractor) will:

- During detailed design, review and confirm all permits, licences and approvals that must be acquired as part of implementing the undertaking; and
- Obtain all required permits, licences and approvals prior to implementation of the undertaking.

9.3.1 Private Entities

9.3.1.1 Canadian National Railway

Metrolinx will continue to coordinate and consult with CNR, as appropriate during detailed design where there are interfaces with freight territory.

9.3.1.2 Canadian Pacific Railway

Metrolinx will continue to coordinate and consult with CPR, as appropriate during detailed design where there are interfaces with freight territory.

9.3.1.3 VIA Rail

Metrolinx will continue to coordinate and consult with VIA, as appropriate during detailed design where there are interfaces with VIA Rail territory.

9.3.2 Federal

9.3.2.1 Impact Assessment Act

On June 21, 2019, Bill C-69, *the Impact Assessment Act* received Royal Assent. The new *Impact Assessment Act* (IAA) and its regulations establish the legislative basis for the federal EA process. The Regulations Designating Physical Activities (the Project List) define the types of projects that may require an EA and were published in the Canada Gazette, Part II, on August 21, 2019. *The Information and Management of Time Limits Regulations* were also published at this time.

The IAA focuses federal reviews on projects that have the potential to cause significant adverse environmental effects within areas of federal jurisdiction. Proponents must review the *Project List* to determine whether the proposed project/activities will require a Federal EA. If the proposed project/activities of this Project are listed within the *Project List*, a Project Description must be prepared for submission to the Impact Assessment Agency (and other federal authorities, if applicable) to discuss and confirm the applicability of the Federal EA process.

Based on a review of the *Project List*, the physical activities listed in Table 9-1 may be relevant to the Project and were therefore reviewed in the context of the Project.

TABLE 9-1 DESIGNATED PHYSICAL ACTIVITIES THAT MAY BE RELEVANT TO THE NEW TRACK & FACILITIES TPAP PROJECT

Section within Regulations Designating Physical Activities (Canada Gazette, Part II, 2019)	Description of Designated Physical Activity (Canada Gazette, Part II, 2019)	Proposed as part of New Track & Facilities TPAP (Yes/No)
Section 1 a)	The construction, operation, decommissioning and abandonment of a new electrical generating facility or electrical transmission line in a wildlife area, migratory bird sanctuary or protected marine area.	No – the Project does not include the construction, operation, decommissioning and abandonment of a new electrical generating facility or transmission line in a wildlife area, migratory bird sanctuary or protected marine area.
Section 1 h)	The construction, operation, decommissioning and abandonment of a new railway line in a wildlife area, migratory bird sanctuary or a protected marine area.	No – the Project does not include the construction, operation, decommissioning and abandonment of a new railway line in a wildlife area, migratory bird sanctuary or protected marine area.
Section 11 a)	The construction, operation, decommissioning and abandonment of a new railway line in a national park.	No – the Project does not include the construction, operation, decommissioning and abandonment of a new railway line in a national park.

Section within Regulations Designating Physical Activities (Canada Gazette, Part II, 2019)	Description of Designated Physical Activity (Canada Gazette, Part II, 2019)	Proposed as part of New Track & Facilities TPAP (Yes/No)
Section 54 a)	The construction, operation, decommissioning and abandonment of a new railway line that requires a total of 50 km or more of new right of way and is capable of carrying freight or passengers between cities.	No – The Project does not include the construction, operation, decommissioning and abandonment of a new railway line that requires a total of 50 km or more of new right of way and is capable of carrying freight or passengers between cities.
Section 54 b)	The construction, operation, decommissioning and abandonment of a new railway yard with a total area of 50 ha or more.	No – the Project does not include the construction, operation, decommissioning and abandonment of a new railway yard with a total area of 50 ha or more.
Section 55	The expansion of an existing railway yard, if the expansion would result in an increase of its total area by 50% or more and a total area of 50 ha or more.	No – the project scope does not include expansion of an existing railway yard, if the expansion results in an increase of its total area by 50% or more and a total area of 50 ha or more.

None of the proposed works/infrastructure associated within the New Track and Facilities TPAP project trigger the IAA based on the review undertaken at the time of writing this EPR (which was completed on the basis of a conceptual design). Notwithstanding this, should any changes to the proposed project works or design be made during detailed design, further review of the IAA triggers will be reviewed to confirm that the requirements of the IAA do not apply.

9.3.2.2 Environment and Climate Change Canada

Butternut trees are protected under the federal *Species at Risk Act* (SARA), in addition to being protected under Ontario's *Endangered Species Act* (ESA). The presence/absence of Butternuts will be confirmed during detailed tree inventories as part of detail design. Should any Butternuts be found during detailed tree inventories, appropriate approvals under SARA will be obtained. Parks Canada will also be notified in the event any Butternut trees are identified.

Environment and Climate Change Canada (ECC) is responsible for the *Migratory Birds Convention Act* (MBCA) and for the *Species at Risk Act* (SARA). The MBCA protects migratory birds, their eggs and nests. Section 5 of the MBCA prohibits possession of a migratory bird or nest except as authorized by the regulations. The Migratory Bird Regulation (MBR) Section 6 prohibits the disturbance or destruction of a nest or egg of a migratory bird, with the exception when a permit is issued. Under the current MBCA, a permit cannot be issued for the incidental take of migratory birds caused by the development of the project.

The SARA protects all wildlife species at risk listed in Schedule 1 of the *Act* including aquatic species and migratory birds (including their habitat) found on federal and provincial/territorial lands. The Ontario Ministry of Environment Conservation and Parks (MECP) shares responsibilities with Environment and Climate Change Canada for protecting the habitat of federally listed migratory species.

Nests and eggs of protected migratory birds shall not be destroyed during migratory bird nesting season (April 1st to August 31st) to avoid a permit under the *Migratory Birds Convention Act*. If an active nest of a migratory bird must be damaged or destroyed, a permit under this *Act* is required.

9.3.2.3 Transport Canada

Transport Canada is responsible for administering the *Railway Safety Act* (RSA). The RSA governs how construction, operation and maintenance of a railway may occur under the legislative authority of

parliament. All future project designs must be consistent and conducted within the requirements of the RSA.

Transport Canada is also responsible for administering the *Canadian Navigable Waters Act* (CNWA), which received royal assent on June 21, 2019. The CNWA is an amendment to the former *Navigation Protection Act* and is intended to strengthen environmental protection by expanding the regulation of major works and obstructions on all navigable waters, even those not explicitly defined with a Schedule to the Act, such as the Don River. The amended *Act* still applies to works which are constructed or placed in, on, over, under, through, or across any navigable water.

Electrification of the Richmond Hill corridor is not anticipated to cross any waterways (scheduled or otherwise); however, it is possible that a structure over the Don River will require rehabilitation to facilitate train movement into the non-electrified Don Valley Layover Facility. This determination will be made by the Contractor during the future detailed design stage. The Contractor may complete the rehabilitation (if required) work, provided:

- a. The work, or its construction, placement, alteration, rebuilding, removal or decommissioning, would not interfere with [marine] navigation; and
- b. Before beginning the construction, placement, alteration, rebuilding, removal or decommissioning, the owner [or their Agent] deposits any information specified by the Minister [of Transport] in any place specified by the Minister and publishes a notice in any manner, and including any information, specified by the Minister.

Notwithstanding this, *Canadian Navigable Waters Act* provisions will be reviewed during detailed design, and the Contractor shall abide by the requirements of applicable legislation including the CNWA and will submit/obtain all required permits/approvals under the CNWA prior to construction.

Transport Canada is also responsible for administering the *Transportation of Dangerous Goods Act* (TDGA). The TDGA regulates the transportation of dangerous goods by air, marine, rail and road. At this time none of the activities required as part of the Project are anticipated to require authorization under this Act. Notwithstanding this, TDGA provisions will be reviewed during detailed design, and the Contractor shall abide by the requirements of applicable legislation including the TDGA.

9.3.3 Provincial

9.3.3.1 Ministry of the Environment, Conservation and Parks – O. Reg. 231/08

The assessment of environmental impacts associated with transit projects such as the New Track & Facilities Project are governed by *Ontario Regulation 231/08 Transit Projects and Metrolinx Undertakings*, under the *Environmental Assessment Act*. In accordance with this regulation, a Transit Project Assessment Process (TPAP) was carried out as documented in this EPR. This process commences with the filing a Notice of Commencement, includes public & stakeholder consultation opportunities and concludes with a Notice of Completion. The TPAP is complete when a Statement of Completion is filed with the Director and Regional Director of the Ministry of the Environment, Conservation and Parks (MECP).

9.3.3.2 MECP - Model Municipal Noise Control Bylaw

The MECP stipulates limits on noise emissions from individual items of equipment, rather than for overall construction noise. In the presence of persistent noise complaints, sound emission standards for the various types of construction equipment used on the project should be checked to ensure that they meet the specified limits contained in MECP Publication NPC-115 – “Construction Equipment” (MOE 1977b).

9.3.3.3 MECP - Permit to Take Water

Environmental Activity Sector Registry (EASR) is required for temporary water takings for volumes between 50,000 L/day (7.5 lgpm) to 400,000 L/Day (or 73.38 lgpm). Whereas, a Permit to Take Water (PTTW) is issued under Section 34 of the *Ontario Water Resources Act* (OWRA) for temporary water takings that exceed the trigger threshold of 400,000 L/day (or 73.38 lgpm). The need for dewatering during construction activities will be confirmed during detailed design, as will the requirement for a PTTW or EASR. Potential impacts will be assessed and strategies for mitigation will be proposed during detailed design as part of the PTTW and/or EASR process, if required.

Should either a PTTW or EASR be required, dewatering and monitoring procedures will be implemented and monitored (e.g., pumping rate/volume monitoring, groundwater level monitoring and groundwater discharge monitoring).

9.3.3.4 MECP - Environmental Compliance Approval(s)

An Environmental Compliance Approvals (ECA) for stormwater works/drainage, noise and/or air emissions will be obtained, if required, for each of the Layover and Storage Yard Facilities sites prior to construction.

9.3.3.5 MECP - Ontario Water Resources Act

For any private water supply wells that were identified as being located within the property boundaries of the proposed layover/storage yard facilities as detailed in Chapter 5 of this EPR and **Appendix A**, a well survey will be conducted during detailed design to verify if the wells are actually present. If present, these wells and any others identified as part of detailed design should be decommissioned in accordance with *Ontario Regulation 903* prior to commencement of any construction activities.

9.3.3.6 MECP - Clean Water Act

Ontario's *Clean Water Act* provides a basic framework for protecting drinking water supplies in the province. This involves identifying and assessing risks to the quality and quantity of drinking water sources to determine which risks are significant; developing a source protection plan to establish how the risks will be addressed; and implementing the plan through land use planning and regulatory mechanisms or voluntary initiatives. The hydrogeological impact assessment completed as part of the TPAP involved identification and assessment of relevant groundwater and groundwater dependent natural heritage features, including the presence of water supply wells, wellhead protection areas and significant groundwater recharge areas. As part of the groundwater impact assessment, potential effects related to the New Track & Facilities Project were assessed and mitigation measures were identified along with the need for further assessment during the detailed design stage of the project (see Chapter 5, 6 and 7 of this EPR).

With respect to wellhead protection areas and Source Water Protection regulations, these policies will be reviewed in detail as part of the final design phase to confirm their applicability to project works. At the time of writing this EPR, in terms of project construction activities, it is acknowledged that there is potential for spills of fuels or other hazardous materials to occur during fueling of construction equipment or other construction activities, which may affect groundwater quality. Therefore, mitigation and commitments to address these effects are outlined in Section 9.7 and Section 9.4.5.

9.3.3.7 MECP - Endangered Species Act

When potential impacts to Species at Risk are confirmed at detail design, options for reducing or mitigating the impacts to these species will be evaluated, including the implementation of additional timing restrictions. The MECP is responsible for administering the *Endangered Species Act* (ESA). Under this Act, certain activities within regulated habitat, or which involve species at risk, require authorizations

and approvals from the MECP (as per *Ontario Regulation 242/08*). With regard to the NTF project, the following items are anticipated:

- **Butternut Trees** – Any Butternut trees found during detailed tree inventories will require a Butternut Health Assessment to be completed by a qualified Butternut Assessor. Dependent on the number and health of Butternuts impacted, registration or permit will be required in consultation with MECP/MNRF;
- **Bats** – Based on consultation with MECP, further studies may need to be completed at detail design (detailed SAR bat surveys, during detailed tree/vegetation inventories, surveys for snags/tree cavities, etc.) to determine any approvals that may be required for bats; and
- **Barn Swallows** – prior to construction for bridge modifications, surveys will need to be completed to determine if Barn Swallows are present. If Barn Swallows are present, Notice of Activity (Registration) will be required.

9.3.3.8 Ministry of Natural Resources and Forestry

The Ministry of Natural Resources and Forestry (MNRF) supports the MECP's administration of the ESA as the host agency of the Natural Heritage Information Centre (NHIC). The NHIC manages data concerning the location of species of conservation concern, plant communities, wildlife concentration areas, and natural areas in Ontario. The Centre also assigns conservation status ranks to species, plant communities and wildlife concentration areas. These ranks are then used by the province, national organizations and international organizations to help assign legal statuses and other conservation designations.

In this context, Metrolinx (or their Contractor) will further engage with MNRF/NHIC staff as a component of identifying and securing SAR registrations and approvals (as required, and if necessary).

9.3.3.9 Forestry Act

Compliance with the provincial *Forestry Act* may be required in limited instances where trees are planted or removed on the boundary between two lands (i.e., lands that are Metrolinx owned and lands that are not Metrolinx owned). The requirements of the *Forestry Act* will be further reviewed in relation to the Project as part of detailed design.

9.3.3.10 Ministry of Heritage, Sport, Tourism and Culture Industries

The Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) is responsible for overseeing all approvals related to the *Ontario Heritage Act*, which generally include:

- Sign-off on proposed archaeological assessment documentation; and
- Should any heritage attributes be removed or demolished as part of the New Track & Facilities undertaking, approval from the MHSTCI will be required.

9.3.3.11 Ministry of Transportation

Permits will be required from the Ministry of Transportation (MTO) prior to any work taking place within or adjacent to the MTO Highway right-of-way (ROW). MTO encroachment permits are also required for any investigation or survey work within the ROW prior to construction.

Continued coordination with MTO will be undertaken as throughout detailed design and construction as required, particularly when any modifications are proposed within MTO ROW and/or adjacent to MTO structures.

9.3.4 Municipal

A range of municipal permits and approvals may be required for the Project, particularly as they pertain to municipally owned lands and infrastructure. Metrolinx will obtain all required permits and approvals. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals.

Metrolinx will consult with the relevant municipalities during detailed design to address impacts, if any, to municipal water, sanitary, and storm sewer systems. Metrolinx shall continue to communicate and engage with relevant municipalities during detailed design and construction planning to address municipal concerns.

9.3.4.1 Municipal Noise By-laws

When possible, construction should be limited to the time periods allowed by the locally applicable municipal by-laws (generally during the daytime hours and during weekdays). Certain type of construction work can only be completed at night when trains are not in service (i.e., outside of business hours). Although provincial agencies such as Metrolinx are not subject to municipal by-laws, Metrolinx (or their Contractor) will endeavour to adhere to these local by-laws as a best practice, wherever practical.

9.3.4.2 Municipal Sewer Use By-Laws

Applications may be submitted for review and information to municipalities relating to any sewer discharge that may be required due to construction activities.

9.3.4.3 Municipal Tree Permits

Permits related to Municipal Tree By-laws and other applicable municipal tree removal permits will be obtained as appropriate and as outlined in Metrolinx's Vegetation Guideline (2020), available here: https://www.metrolinxengage.com/sites/default/files/mx_vegguide-final_draft_s001-gen-7761-005_reduced_size.pdf.

9.3.4.4 Conservation Authorities

Metrolinx as a Crown Agency of the Province of Ontario is not subject to the *Conservation Authorities Act*. However, Metrolinx will engage with the Conservation Authority to incorporate their requirements as a best practice, where practical, and may obtain associated permits and approvals or engage in a Voluntary Project Review, where applicable.

9.3.4.5 Toronto and Region Conservation Authority

The following commitments specific to the Toronto and Region Conservation Authority (TRCA) will be adhered to during detailed design and construction:

- Ensure that TRCA's Stormwater Management guidelines are adhered to during detailed design for layover/storage yard facilities;
- Additional coordination with TRCA will be carried out to complete a detailed hydraulic analysis for layover/storage yard facilities within a floodplain during detailed design;
- A slope stability analysis will be completed in consultation with the municipality for the Don Valley Layover and Unionville Storage Yard Facilities during detailed design;
- Metrolinx will work with the TRCA to address the overall setback distance (Erosion Hazard Limit) as described in TRCA Geotechnical Engineering and Design Submission Requirements, as well as the Erosion and Sediment Control Guide for Urban Construction;

- 2-D Hydrologic Engineering Center River Analysis System (HEC-RAS) modelling and cut-and-fill analysis for flood control and potential fluvial geomorphology investigation shall be completed at the Don Valley layover site, with consideration given to the latest Don River Hydrology Study by TRCA;
- Floodplain impacts resulting from the Don Valley Layover site will be mitigated to the extent that is feasible and reasonable;
- Options will be explored for Low Impact Development (LID) at the proposed Unionville Storage Yard facility site;
- The TRCA will be engaged during detailed design, as required, through the established Voluntary Project Review process; and
- Further discussions and consultation with TRCA will be undertaken as appropriate during detail design.

9.3.4.6 Halton Region Conservation Authority

The following commitments specific to the Halton Region Conservation Authority (CH) will be adhered to:

- Engage with CH staff on typical requirements under *Ontario Regulation 162/06* if it is determined that modifications to existing culverts is required; or if expansion is required beyond the existing developed track area in the vicinity of the Lower Morrison Creek (Town of Oakville);
- Continue consultation with CH with respect to Shoreacres Creek culvert expansion at the proposed Walkers Line Layover Facility;
- Metrolinx shall work with CH to address the concerns included within the project-specific EA and the culverts and bridges checklists prepared by CH. Although Metrolinx as a Crown agency, is not bound by Conservation Halton's Regulation O. Reg. 162/06. Metrolinx shall consult and have regard for CH's policies and regulations during the detailed design of layover facilities;
- A slope stability analysis will be completed in consultation with the municipality for the Walkers Line Layover Facility during detailed design;
- 2-D HECRAS modelling, cut-and-fill analysis for flood control, Geotechnical investigation for toe erosion allowance and stable slope allowance, and Fluvial Geomorphology investigation shall be completed at the Walker's Line Layover site; and
- Further discussions and consultation with CH will be undertaken, as appropriate, during detail design.

9.3.4.7 Lake Simcoe Region Conservation Authority

The following commitments specific to the Lake Simcoe Region Conservation Authority (LSRCA) will be adhered to:

- Currently, the proposed infrastructure is to remain within the rail ROW. Should any infrastructure be proposed to extend outside of the ROW and is within a regulated area, LSRCA will be engaged, as required, during detailed design through the established Voluntary Project Review process;
- Ensure that LSRCA's Low Impact Development (LID) guidelines are adhered to during detailed design for projects within the Lake Simcoe Watershed, as applicable; and
- Further discussions and consultation with LSRCA will be undertaken, as appropriate, during detail design.

9.3.4.8 Central Lake Ontario Conservation Authority

The following commitments specific to the Central Lake Ontario Conservation Authority (CLOCA) will be adhered to:

- Continue consultation with CLOCA with respect to potential Corbett Creek culvert modifications/replacement, if required;
- The CLOCA will be engaged, as required, during detailed design of the Thickson Road Bridge Expansion and Oshawa GO Station Platform; and
- Further discussions and consultation with CLOCA will be undertaken, as appropriate, during detail design.

9.4 Design & Engineering Commitments

9.4.1 Property

Metrolinx will proceed with property acquisition as follows:

- Based on the NTF detailed design, confirm locations where temporary/permanent easements/property acquisition will be required prior to project construction; and
- Obtain all easements/property acquisitions from public/private property owners that are required to implement the project in accordance with Metrolinx's approved property acquisition process.

9.4.2 Construction Management Plans

Construction Management Plans will be developed and implemented during the detailed design phase and implemented as part of construction, taking into consideration applicable legislation as appropriate.

9.4.3 Construction Staging Areas

Construction staging and laydown areas are used for the storage and assembly of construction equipment, materials, and other supplies. These areas are typically located near or at the construction site.

The GO Expansion program will require a large number of construction staging and laydown areas over an extended period of time. Metrolinx understands the importance of addressing and mitigating construction impacts and is developing a new approach to managing construction staging and laydown areas. This approach looks at the best practices and will help minimize environmental risk without unduly affecting our surrounding communities, natural areas, as well as project cost and schedule.

The locations of specific construction staging areas required for the New Track and Facilities Project will be identified during detailed design. As these areas were unknown at the time of preparing this EPR, any potential environmental impacts and mitigation associated with construction staging areas have not been assessed. Therefore, any additional mitigation or monitoring measures that will be necessary to avoid or offset potential impacts related to the physical footprint and/or construction activities to be carried out at construction staging areas will need to be reviewed at the detailed design stage and subsequently implemented. Any associated EPR Addendum requirements will also be identified.

The following is a non-exhaustive summary of applicable best management practices that will be applied to the selection and management of construction staging areas. These measures are in addition to other applicable mitigation presented elsewhere within this EPR:

Construction Planning

- Before construction commences, select methods, operations, materials, and equipment to minimize air pollution;
- Minimize road traffic congestion by reducing the duration of traffic interference with higher production rates and off-site fabrication; and
- Minimize frequency of equipment and materials deliveries by judicious forward planning.

Site Preparation

- Keep vegetation intact until just prior to construction occurring on that segment of the construction site;
- Compact and stabilize disturbed soil throughout the construction site;
- Stabilize surface soils where trencher, excavator or support equipment will operate and at the completion of trenching operations; and
- Stabilize surfaces of completed earthworks with stone/soil/geotextiles within 10 days or vegetation within 21 days after active operations have ceased.

Operations

- Stockpiles within 30 m of occupied buildings must not be greater than 3 m in height or must be properly irrigated;
- Stabilize material while loading, transporting, and unloading;
- Maintain at least 15 cm of freeboard on haul vehicles;
- Establish on-site vehicle restrictions;
- Stabilize all off-road traffic and parking areas as well as haul routes; and
- Remove any caked dirt or mud from vehicle and equipment wheels.

9.4.4 Traffic Control & Management Plans

Metrolinx (or their Contractor) will coordinate with Municipalities and road authorities, as appropriate during detailed design, to develop traffic, parking, transit, cycling and pedestrian management strategies prior to commencement of construction to avoid or minimize interferences to traffic to the extent possible during construction. Refer to Chapter 7 for further detail.

9.4.5 Spill Prevention and Response Plan

A Spill Prevention and Response Plan will be prepared prior to commencing construction to govern spill response and ensure proper mitigation and notification procedures are in place. In addition, the following measures will be adhered to:

- Ensure spill kits are on-site at all times for implementation in the event of an accidental spill during construction;
- Operate, store and maintain all equipment and associated materials in a manner that prevents the entry of any deleterious substance to a waterbody;
- All mobile equipment will have drip pans installed and refueling will take place no closer than 30 metres to any study area watercourses or ditchlines in order to prevent water contamination due to accidental fuel spills;

- Fuel transport will be conducted in compliance with the *Transportation of Dangerous Goods Act*;
- All necessary precautions shall be implanted to prevent the spillage and release of hazardous materials to the environment;
- All leaks or spills are to be immediately reported to the Ministry of the Environment, Conservation and Parks (MECP), Spills Action Centre at 1-800-268-6060;
- Use shrouding or debris platforms to trap and prevent concrete and other bridge materials from entering the watercourse during construction;
- The layover/storage yard facilities will be fully equipped with spill containment and oil/water separation facilities. In the event on an equipment failure, oily water will not escape from the site;
- Spill cleanup and response equipment will be located on site;
- Spill decks should be used for transferring products to smaller containers;
- Fire extinguishers should be located near petroleum, oil and lubricants storage areas; and
- Routine inspection of the facilities, including transformer oil should be carried out.

9.4.6 Erosion and Sediment Control Plan

The Contractor will prepare and implement an Erosion and Sediment Control Plan, detailed drainage design and erosion and sediment control drawings in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual (2003), the TRCA Erosion and Sediment Control Guideline for Urban Construction (2019), as amended from time to time, and the guidelines and regulatory requirements of the Conservation Authority having jurisdiction.

Additional mitigation measures/commitments that will be implemented in order to reduce or mitigate the potential for adverse effects caused by sediment and erosion include:

- Adhere to relevant guidelines and Ontario Provincial Standard Specifications (OPSS) relating to proper sediment and erosion controls including consideration of TRCA¹ Erosion and Sediment Control Guidelines for Urban Construction), OPSS 577 (Erosion and Sediment Control Measures) and OPSS 805 (Erosion and Sediment Control Measures);
- Where temporary storage of the soil is required, the soil will be stored immediately adjacent to the excavation site;
- Topsoil and subsoil will not be mixed nor will topsoil be contaminated with any other material;
- Silt fencing will be installed around all designated work areas to prevent any offsite transport of sediment;
- Exposed soils will be hydroseeded within 45 days, both for temporary work areas and final grades;
- Existing vegetation on embankments shall be maintained as long as possible and exposed areas shall be stabilized as soon as possible by seeding and mulching;
- Appropriate lengths of silt fencing will be installed along the perimeter of minimized, designated work areas to limit construction impacts;

¹ As a Crown Agency, GO/Metrolinx is exempt from the *Conservation Authorities Act* and as such does not have a requirement to apply for and obtain permits from conservation authorities. Wherever possible, GO/Metrolinx will engage the conservation authority on specific projects (or components thereof) and will adhere to requirements when and where possible.

- Design and implement erosion and sediment controls to contain/isolate the construction zones, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment to any watercourses, and ensure sites are stabilized prior to removal following construction;
- Stockpiles to be located at a minimum of 30 metres from watercourses and isolated to ensure material will not enter any watercourse or ditchline. All stockpiles are to be removed upon completion of the works and the site restored, as appropriate; and
- Limit access to waterbody and banks to protect riparian vegetation and minimize bank erosion.

9.4.7 Stormwater Management/Drainage

Based on the Preliminary SWM assessments undertaken as part of the TPAP (**Appendix H**) and consultation with Conservation Authorities (CA), there are three (3) layover/storage facility sites that fall partially or entirely within CA Regulated Areas (see Table 9-2). Each facility will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects. Detailed Stormwater Management Plans/Designs will be developed during detailed design in consultation with Conservation Authorities and other applicable review agencies, as appropriate.

TABLE 9-2 SUMMARY OF LAYOVER/STORAGE FACILITIES IN REGULATED AREAS

Conservation Authority	Site	Watershed	Sub-Watershed	Within Regulated Area? ²
CH	Walkers Line	Burlington Urban Creeks Watershed	Tuck Creek and Shoreacres Creek Sub-Watershed	Yes - Partially
TRCA	Unionville	Rouge River Watershed	Mount Joy Creek Sub-Watershed	Yes - Partially
TRCA	Don Valley	Don River Watershed	Lower East Don Sub-Watershed	Yes - Entirely

The following general commitments related to stormwater management will also be fulfilled during detailed design, as appropriate:

- A detailed Stormwater Management Plan/Design will be carried out and will address quantity control, quality control, water balance, and erosion and sediment control, and quality control (see Section 9.4.6 for further information);
- The proposed development areas used in the preliminary SWM assessment were based on conceptual design; therefore, reassessment of the drainage areas and surrounding areas (contributing and outletting) will be required during detailed design;
- Metrolinx's Contractor must identify any property that is required to address storage by retention or detention, in compliance with applicable stormwater management regulations or climate change adaptation criteria;
- Each layover/storage yard facility will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects;
- For floodproofing of the relevant layover/storage yard sites, the facilities will be built 0.3 metres above the floodplain;

² Based on information available at the time of preparing the NTF EPR.

- Where sensitive/endangered fish/fish habitat may be identified near the storage yard site during detailed design, the final design of the SWM features shall take these features into consideration to ensure the SWM facilities will not negatively affect aquatic features;
- The flow contribution to existing ditches, culverts and storm sewers is not currently known. A firm design must be presented that utilizes information from a detailed survey to determine the capacity of site runoff outfalls;
- Computations for the design of any bio-swales needed to meet infiltration requirements will be done at the detailed design stage;
- Site location and footprint for the electrical equipment may continue to be refined at detailed design stage. Drainage areas and imperviousness might have to be reassessed and flow computations revised/updated;
- If required, MECP, Regulatory Agencies and relevant municipalities will be contacted for their comments and approvals; and
- A Wetland Water Balance Risk Evaluation will be completed at detail design as soon as the design is sufficiently advanced to make such an assessment possible to limit the risk of unexpected delays due to potential monitoring requirements.
 - Please note that a Wetland Water Balance Risk Evaluation is a tool utilized for determining the intensity of the required monitoring at a specific site, whereas a Feature Based Water Balance may result in a lengthy monitoring program to ensure that seasonal variations in hydrology are considered for surrounding wetlands.

9.4.8 Walkers Line Layover Facility

A conceptual design was completed for the Walkers Line Layover Facility as part of the TPAP. The following commitments related to further stormwater management assessment for the Walkers Line Layover Facility will be fulfilled during detailed design as appropriate:

- Adherence with the SWM measures as outlined in Section 9.4.7;
- During detailed design, a detailed stormwater management plan/design will be carried out and will address quantity control, quality control, water balance, and erosion and sediment control;
- Complete a hydrologic and hydraulic analysis for the detailed design;
- Given the potential extension/replacement of existing 3-cell precast concrete box culvert and realignment of Shoreacres Creek, 2-D HEC-RAS modelling, cut-and-fill analysis for flood control, Geotechnical investigation for toe erosion allowance and stable slope allowance, and Fluvial Geomorphology investigation will be required for this site;
- During detailed design, Halton Region Conservation Authority shall be consulted to confirm regulation limits and flood lines;
- A pertinent geotechnical study, including slope stability assessments and analyses to design the earthworks, grading and site alterations, will be required. The earthworks include cut and fill or any excavation in the valley or fill placement and embankment. This assessment is not only limited to the permanent design, but include any temporary means and methods needed to facilitate the construction of various elements (including temporary construction access, construction pads, temporary crossings, if needed, and stabilization of the temporary excavations and shoring provisions and reconstruction of the areas and slopes after the temporary excavations. In case of ground improvement techniques, the temporary disturbance is also needed to be taken into consideration for the design of the works. All necessary reports, design

briefs and engineer-stamped drawings are also needed to be developed at the detailed design stage in support of the proposed work;

- The proposed development areas and their locations used in the preliminary SWM assessment as documented were based on conceptual design; therefore, reassessment of the drainage areas and surrounding areas (contributing and outletting) will be required at the subsequent detailed design stage;
- The stormwater management plan/design will be developed in consultation with Halton Region Conservation Authority, Halton Region, the City of Burlington, and other applicable review agencies, as appropriate;
- Coordination with other proposed utility works is required during detailed design stage;
- Review of other disciplines' impact assessment reports (i.e., Natural Environment, Hydrogeology, Geotechnical, Land Use, etc.) is required prior to carrying out detailed design;
- Identify property necessary to address storage by retention or detention to satisfy compliance with stormwater management regulations or additional climate change adaptation criteria stipulated by Metrolinx within the Project Agreement;
- Implement the stormwater management plan/design prior to commencing operation of the layover facility;
- Each layover facility will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects;
- For floodproofing of the relevant layover sites, the facilities will be built 0.3m above the floodplain;
- Where sensitive/endangered fish/fish habitat may be identified near the layover sites during detailed design, the final design of the SWM features shall take these features into consideration to ensure the SWM facilities will not negatively affect aquatic features;
- If required, this site will be investigated further for flood elevations, floodproofing and cut and fill balance within the floodplain, during the detail design stage;
- Flow contribution to the existing ditches/swales, culverts, and storm sewer and their capacities are not known at this stage and will be investigated at the detailed design stage;
- Runoff coefficient for open space will be verified after soil type is determined during detailed design investigation;
- Municipal data for the existing infrastructure downstream and any approvals (if required) for discharging runoff from the development sites to the existing drainage system downstream will be obtained at detailed design stage.
- Computations for the design of treatment train will be done at the detailed design stage;
- Detailed erosion and sediment control plans will be prepared for works prior to the commencement of construction;
- Site location and footprint for the electrical equipment may continue to be refined at detailed design stage. Drainage areas and imperviousness might have to be reassessed and flow computations revised/updated;
- If required, MECP, Regulatory Agencies and relevant municipalities will be contacted for their comments and approvals;

- A computer-based model will be developed to assess the site's hydrology and hydraulics. If the rational method is used, runoff coefficients will be adjusted when evaluating larger storm events; and
- The City of Burlington has developed new Stormwater Management Design Guidelines (2020) at the time of finalizing this report. Recalculation of run-off flows is required at subsequent design stages to confirm the findings of this report.

9.4.9 Unionville Storage Yard Facility

A conceptual design was completed for the Unionville Storage Yard as part of the TPAP. The following commitments will be fulfilled during detailed design, as appropriate:

- The Unionville Storage Yard is intended use is for daytime use only. Should Metrolinx proceed with overnight storage at this site, an addendum will be prepared as per *O. Reg 231/08*;
- Adherence with the SWM measures as outlined in Section 9.4.7;
- Further investigation and analysis of all flooding impacts, including potential backwatering (downstream) and overflows (upstream) is required prior to or in conjunction with detailed design;
- 2-D HEC-RAS modelling and cut-and-fill analysis for flood control and potential Fluvial Geomorphology investigation is to be completed at the site, with consideration given to the Rouge River Hydrology Study, Wood Environmental & Infrastructure Solutions, 2018;
- Since the Unionville Storage Yard site is partially within the TRCA regulated area, the site will be investigated further, for flood elevations, floodproofing and cut and fill balance within the floodplain, during the detailed design stage;
- TRCA will be consulted during detailed design to confirm regulation limits and flood lines;
- A pertinent geotechnical study, including slope stability assessments and analyses to design the earthworks, grading and site alterations, will be required. The earthworks include cut and fill or any excavation in the valley or fill placement and embankment. This assessment is not only limited to the permanent design, but include any temporary means and methods needed to facilitate the construction of various elements (including temporary construction access, construction pads, temporary crossings, if needed, and stabilization of the temporary excavations and shoring provisions and reconstruction of the areas and slopes after the temporary excavations). In case of ground improvement techniques, the temporary disturbance is also needed to be taken into consideration for the design of the works. The minimum acceptable factor of safety required for slope stability assessment is 1.50. All necessary reports, design briefs and engineer-stamped drawings will be developed at the detailed design stage in support of the proposed work;
- During detailed design, a detailed stormwater management plan/design will be carried out and will address quantity control, quality control, water balance, and erosion and sediment control;
- A slope stability analysis is required at the north limit of the proposed storage yard site, where the proposed access road is partially encroaching on the existing south bank of the Rouge River. Impacts and mitigation measures shall be further investigated following completion of the slope stability analysis and during detailed design. Safe access to the site for construction staging will also be reviewed at this time;
- The proposed development areas and their locations used in the preliminary SWM assessment as documented were based on conceptual design; therefore, reassessment of the drainage areas

and surrounding areas (contributing and outletting) will be required at the subsequent detailed design stage;

- The stormwater management plan/design will be developed in consultation with the TRCA and other applicable review agencies, as appropriate;
- Coordination with other proposed utility works is required during detailed design stage;
- Review of other disciplines' impact assessment reports (i.e., Hydrogeology, Geotechnical, Land Use, etc.) is required prior to carrying out detailed design;
- Identify property necessary to address storage by retention or detention to satisfy compliance with stormwater management regulations or additional climate change adaptation criteria stipulated by Metrolinx within the project agreement;
- Implement the stormwater management plan/design prior to commencing operation of the storage yard;
- The Storage Yard will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects:
 - To avoid/minimize excavation and dewatering requirement, shallow foundations are recommended; and
 - Final site condition and temporary conditions (during construction) shall avoid alteration to the valley and other water features.
- Flow contribution to the existing ditches/swales, culverts, and storm sewer and their capacities are to be confirmed at the detailed design stage;
- Municipal data for the existing infrastructure downstream and any approvals (if required) for discharging runoff from the development sites to the existing drainage system downstream will be obtained at detailed design stage;
- Computations for the design of treatment train will be done at the detailed design stage;
- Detailed erosion and sediment control plans will be prepared for works prior to the commencement of construction;
- Site location and footprint for the electrical equipment may continue to be refined at detailed design stage. Drainage areas and imperviousness might have to be reassessed and flow computations revised/updated;
- If required, MECP, Regulatory Agencies and relevant municipalities will be contacted for their comments and approvals;
- Coordination for future regional or municipal infrastructure works should be taken in consideration during subsequent design stages. Future works within York Region and The City of Markham have not been identified at this time;
- Based on the detailed design, confirm locations where temporary/permanent easements/property acquisition will be required prior to Project construction, and obtain all easements/property acquisitions from public/private property owners that are required to implement the project in accordance with Metrolinx's approved property acquisition process;
- The Rouge River and an associated wetland is located adjacent to the proposed Storage Yard. Suitable sedimentation controls should be in place to help control and reduce the turbidity of runoff water which may flow towards the river; and

- The City of Markham is undertaking the “Markham Centre Secondary Plan”. Future coordination to be completed with the city during the detailed design stage.

9.4.10 Don Valley Layover Facility

A conceptual design was completed for the Don Valley Layover Facility as part of the TPAP. The following commitments related to further stormwater management assessment for the Don Valley Layover Facility will be fulfilled during detailed design as appropriate:

- Adherence with the SWM measures as outlined in Section 9.4.7;
- Further investigation and analysis of all flooding impacts, including potential backwatering (downstream) and overflows (upstream) is required prior to or in conjunction with detailed design;
- Metrolinx is working with TRCA to identify areas in proximity to the Don River where development should be avoided to reduce future flooding risks. TRCA is currently updating the SWM model for in-depth analysis and is undertaking a study to examine alternatives and impacts for flood mitigation in the Don Valley. Results and recommendations from those studies shall inform detailed design;
- 2-D HEC-RAS modelling and cut-and-fill analysis for flood control and potential Fluvial Geomorphology investigation will be completed at the site during future project phases, with consideration given to the Don River Hydrology Final Report, Marshall Macklin Monaghan, 2018;
- Consultation will be carried out with TRCA as required during subsequent design stages to determine the extent of impacts of planned flood protection works in the immediate and surrounding areas (i.e., West Donlands, Port Lands);
- Since the Don Valley Layover site is fully within the TRCA regulated areas, this site will be investigated further for flood elevations, floodproofing and cut and fill balance within the floodplain, during the detailed design stage;
- TRCA will be contacted during detailed design to provide confirmation of regulation limits and flood lines. A pertinent geotechnical study, including slope stability assessments and analyses to design the earthworks, grading and site alterations, will be required. The earthworks include cut and fill or any excavation in the valley or fill placement and embankment. This assessment is not only limited to the permanent design, but include any temporary means and methods needed to facilitate the construction of various elements (including temporary construction access, construction pads, temporary crossings, if needed, and stabilization of the temporary excavations and shoring provisions and reconstruction of the areas and slopes after the temporary excavations. In case of ground improvement techniques, the temporary disturbance is also needed to be taken into consideration for the design of the works. The minimum acceptable factor of safety required for slope stability assessment is 1.50. All necessary reports, design briefs and engineer-stamped drawings are also needed to be developed at the detailed design stage in support of the proposed work;
- During detailed design, a detailed stormwater management plan/design will be carried out and will address quantity control, quality control, water balance, and erosion and sediment control, and quality control;
- Complete a hydrologic and hydraulic analysis for the detailed design;
- A slope stability analysis is required at the west limit of the proposed layover site, where the proposed modification of the existing access road is encroaching on the existing east bank of the Don River. Impacts and mitigation measures shall be further investigated during detailed design. Safe access is to be reviewed during detailed design;

- The proposed development areas and their locations used in the preliminary SWM assessment as documented were based on conceptual design; therefore, reassessment of the drainage areas and surrounding areas (contributing and outletting) will be required at the subsequent detailed design stage;
- The stormwater management plan/design will be developed in consultation with Conservation Authorities and other applicable review agencies, as appropriate;
- Coordination with other proposed utility works is required during detailed design stage;
- Review of other disciplines' impact assessment reports (i.e., Hydrogeology, Geotechnical, Land Use, etc.) is required prior to carrying out detailed design;
- Identify property necessary to address storage by retention or detention to satisfy compliance with stormwater management regulations or additional climate change adaptation criteria stipulated by Metrolinx within the project agreement;
- Implement the stormwater management plan/design prior to commencing operation of the layover facility;
- The layover facility will be designed such that flooding will not affect proper functioning of the facility and will not result in adverse environmental effects;
- To avoid/minimize excavation and dewatering requirement, shallow foundations are recommended;
- Analyze and recommend Low Impact Development (LID) measures to effectively address Water Quantity and Erosion, while taking flooding risks and space constraints into account (e.g., roof retention might be more appropriate than bioswale given the flooding risk);
- Innovative ESC measures that do not depend on infiltration should be further investigated. It is especially critical at this location for ESC design to address both the ultimate condition and the interim (during construction);
- Areas north of the Prince Edward Viaduct to be designed with pervious surfaces to the degree possible for better stormwater management via the use of products that allow for permeability and turf;
- Proposed new development of the site will minimize grading impacts to the existing site;
- Final site condition and temporary conditions (during construction) shall avoid alteration to the valley and other water features;
- Flow contribution to the existing ditches/swales, culverts, and storm sewer and their capacities are not known at this stage and will be investigated at detailed design stage;
- Municipal data for the existing infrastructure downstream and any approvals (if required) for discharging runoff from the development sites to the existing drainage system downstream will be obtained at detailed design stage;
- Computations for the design of treatment train will be done at the detailed design stage;
- Detailed erosion and sediment control plans will be prepared for works prior to the commencement of construction;
- Site location and footprint for the electrical equipment may continue to be refined at detailed design stage. Drainage areas and imperviousness might have to be reassessed and flow computations revised/updated;

- If required, MECP, Regulatory Agencies and relevant municipalities will be contacted for their comments and approvals;
- Coordination for future regional infrastructure works should be taken in consideration during subsequent design stages; and
- Any design or construction required will follow the City of Toronto's Standards at a minimum.

9.4.11 New GO Station Platforms

The following new platforms at existing GO Stations are proposed:

- Mount Joy GO Station (Stouffville Rail Corridor);
- Oshawa GO Station (Lakeshore East Rail Corridor); and
- Unionville GO Station (Stouffville Rail Corridor).

It should be noted that only potential environmental impacts associated with the physical footprint/location of the proposed platforms have been assessed as part of the New Track and Facilities TPAP on the basis of conceptual design. It is therefore assumed that any ancillary GO Station infrastructure (e.g., expanded parking area to accommodate the new platform/increased ridership) has been/will be assessed under separate Environmental Assessment Studies/TPAPs.

In addition, further engineering design of the new GO Station platforms will be required following the TPAP, including preparation of detailed designs that encompass all required / ancillary elements, including but not limited to: proposed platform designs, drainage, pedestrian access, tunnel designs etc. If additional environmental impacts associated with the detailed designs are anticipated, Metrolinx will review and confirm the need to undertake an Addendum to this EPR.

9.4.12 Thickson Road Bridge Expansion

The existing overhead rail structure at Thickson Road South, in the Town of Whitby, is to be widened to accommodate a new third track extending from the Whitby Maintenance Facility to Oshawa GO Station (refer to **Appendix A1** for location mapping). At the time of preparing the TPAP, a conservative assessment of potential impacts was completed based on the anticipated area of disturbance associated with the expansion works.

Therefore, based on the detailed design to be developed post TPAP, environmental impacts associated with the design will need to be reviewed and EPR Addendum requirements confirmed, if applicable.

As part of the detailed design process, the following will be taken into consideration as per consultation with the Regional Municipality of Durham during the TPAP:

- Continue to consult with the Regional Municipality of Durham as part of developing the design;
- Maintain adequate clearance over Thickson Road without changing the existing road profile; and
- The Region is currently completing a Thickson Road widening project that includes construction of a multi-use path along the east side of Thickson Road, including excavation of the embankment and construction of a retaining wall under the railway bridge. Further coordination with the Region is required during future project phases to ensure the two Projects are aligned.

9.4.13 Overhead Bridges - Structural Assessments (Electrification of Richmond Hill Corridor)

During detailed design, Metrolinx will confirm requirements for undertaking structural assessments and/or condition assessments for bridges to ensure that the overhead bridges along the Richmond Hill corridor can withstand the increased load of adding a solid barrier to the face of the bridge, and to confirm requirements for additional strengthening. These assessments will be submitted as required to the owner

of the structure for review and approval. Any impacts to bridges on the Richmond Hill Rail Corridor that require Bridge Protection Barriers would be temporary, short-term and localized. Construction Management & Traffic Management Plans will be developed in consultation with the City of Toronto.

9.4.14 Grounding and Bonding (Electrification of Richmond Hill Corridor)

To ensure safe touch-and-step potential in accordance with permissible limits (as per applicable international electrical safety codes and standards including AREMA, CSA, EN and IEEE), a grounding and bonding system will be implemented as part of the electrification project. Touch potential is defined as the voltage between an energized object and the feet of a person in contact with the object. Step potential is defined as the voltage between the feet of a person standing near an energized grounded object. A maintenance and inspection procedure for installed grounding and bonding will also be developed.

Grounding and bonding will be installed within 4 meters of the track; notwithstanding this, an evaluation will be undertaken during detailed design to confirm whether anything else in the vicinity will require grounding.

In addition, the following review process will be carried out during detailed to mitigate any identified effects to property owners due to grounding and bonding installation:

- A case by case analysis of any non-Metrolinx owned properties that may be affected by grounding and bonding installation with the rail Right-of-Way will be undertaken; and
- Engage potentially affected property owners, where required.

9.5 Municipalities

The following commitments will be followed by Metrolinx during detailed design and construction:

- Develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents in coordination with Municipalities, as appropriate, to avoid/minimize interference to the extent possible;
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or the Municipality;
- Metrolinx will engage Municipalities during construction planning/scheduling to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities;
- Metrolinx will continue to coordinate with municipalities during detailed design on land use planning and design (e.g., visual/aesthetics) matters;
- Coordination with regard to municipal bridge design, bridge evaluations to determine feasibility of installing protection barriers, extent and type of bridge rehabilitation, and the verification of bridge types, will be undertaken as required during the detailed design phase;
- Carry out future discussions and negotiations with Municipalities in relation to alterations/modifications required on Municipal-owned or jointly-owned bridges/rail overpasses to accommodate electrification; and
- Review options with Municipalities as required to maximize the aesthetics of project infrastructure such as bridge barriers.

9.5.1 Region of Durham

Metrolinx will continue to consult and coordinate with the Region of Durham during the detailed design/construction phases as follows:

- Coordination with the Region regarding Thickson Road Bridge Expansion design (including new third track and retaining wall elements), to determine any impacts to Regional Roads (i.e., road and sidewalk closures, vertical clearance, etc.), Regional utilities (i.e., water and sewer connections) and any necessary mitigation measures;
- Coordinate with the Durham Region Transit regarding potential operational impacts and associated mitigation measures for the new track and platform at Oshawa GO Station; and
- Coordination with the Region with respect to potential Corbett Creek culvert modifications/replacement, if required.

9.5.2 Region of Halton

Metrolinx will continue to consult and coordinate with the Region of Halton during the detailed design and construction phases of the Project as follows:

- Coordination with the Region, as required, with respect to final design of the Walkers Line Layover;
- Confirm municipal water and sewer connections are adequate to support the Walkers Line Layover, ensure coordination with the Region;
- In instances where sanitary sewer connections are required, a Sanitary Sewer Capacity Analysis will be completed at the point of connection, to a sewer trunk; and
- Layover connections to the municipal road network will be further assessed prior to construction, and any proposed improvements will be coordinated with the Region of Halton.

9.5.3 Region of York

Metrolinx will continue to consult and coordinate with the Region of York during the detailed design and construction phases of the Project as follows:

- Develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents in coordination with the Region of York, as appropriate, to avoid/minimize interference to the extent possible;
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or the Region of York; and
- Metrolinx will engage the Region of York during construction planning/scheduling to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities.

9.5.4 City of Burlington

Metrolinx will continue to consult and coordinate with the City of Burlington during the detailed design and construction phases of the Project as follows:

- Coordination with the City, as required, with respect to final design of the Walkers Line Layover;
- Confirm municipal water and sewer connections are adequate to support the Walkers Line Layover and coordinate this work with the City;

- In instances where sanitary sewer connections are required, a Sanitary Sewer Capacity Analysis will be completed at the point of connection, to a sewer trunk; and
- Layover connections to the municipal road network will be further assessed prior to construction, and any proposed improvements will be coordinated with the City of Burlington.
- Complete a slope stability analysis in consultation with the conservation authority for the Walkers Line Layover Facility during detailed design;
- 2-D HEC-RAS modelling, cut-and-fill analysis for flood control, Geotechnical investigation for toe erosion allowance and stable slope allowance, and Fluvial Geomorphology investigation shall be completed at the layover site; and
- A Groundwater Management Plan will be developed prior to construction of the Walkers Line Layover to guide the handling, management, and disposal of groundwater encountered during the proposed works;
- Review options to minimize potential drainage impacts of project infrastructure such as permeable surfaces for access roads and parking areas;
- Develop traffic management strategies to be included in construction contract documents in coordination with the City, as appropriate, to avoid/minimize interference to the extent possible and ensure safe access to the Walkers Line Layover; and
- A Drainage and Stormwater Management Report, an Erosion and Sediment Control Plan and detailed drainage design and erosion and sediment control drawings will be prepared, implemented and monitored in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual and the Greater Golden Horseshoe's Erosion and Sediment Control Guideline for Urban Construction.

9.5.5 City of Markham

Metrolinx will continue to consult and coordinate with the City of Markham during the detailed design and construction phases of the Project as follows:

- The Unionville Storage Yard is intended use is for daytime use only. Should Metrolinx proceed with overnight storage at this site, an addendum will be prepared as per *O. Reg 231/08*;
- The City of Markham is undertaking the "Markham Centre Secondary Plan" and updating the "Markham Road – Mount Joy Secondary Plan". Future coordination to be completed with the city during the detailed design stage;
- Coordination with the City as required with respect to final design of the Unionville Storage Yard;
- Metrolinx shall consult with City of Markham Urban Design Staff for potential alternatives to a chain link fence;
- Confirm municipal water and sewer connections are adequate to support the Unionville Storage Yard and coordinate this work with the City;
- In instances where sanitary sewer connections are required, a Sanitary Sewer Capacity Analysis will be completed at the point of connection, to a sewer trunk; and
- Storage Yard connections to the municipal road network will be further assessed prior to construction, and any proposed improvements will be coordinated with the City of Markham.

9.5.6 City of Toronto

Metrolinx will continue to consult and coordinate with the City of Toronto during the detailed design and construction phases of the Project as follows:

- Carry out future discussions and negotiations with City of Toronto in relation to an Access Agreement for the proposed Don Valley Layover access road;
- Any design or construction required will follow the City of Toronto's Standards at a minimum;
- Develop traffic management strategies to be included in construction contract documents in coordination with the City, as appropriate, to avoid/minimize interference to the extent possible and ensure safe access to the Don Valley Layover;
- Review options to maximize the aesthetics of project infrastructure such as the views of the Don Valley Layover from the Prince Edward Viaduct and the Lower Don River Trail;
- Spill Action Plans will be developed by the contractor to specify the methodology to limit and mitigate any potential impacts from spills during construction;
- A Groundwater Management Plan will be developed prior to construction of the Don Valley Layover to guide the handling, management, and disposal of groundwater encountered during the proposed works;
- Coordinate with the City of Toronto to review detailed designs affecting urban wildlife and wildlife habitat (i.e., lightning, noise, etc.) and incorporate feedback/input into final designs as appropriate;
- Develop pedestrian management strategies to be included in construction contract documents in coordination with the City, as appropriate, to avoid/minimize interference to the Lower Don Trail and, if necessary, reconstruct it to City standards;
- Confirm locations of any facility buildings/structures and overhead equipment, as there is the potential for interferences from salt spray;
- Periodic air quality evaluations of diesel emissions will occur at the Don Valley Layover to ensure specific standards/mitigation measures are adhered to;
- Coordination with the City, as required, with respect to the Metrolinx Vegetation Guideline (2020);
- Review options to minimize potential drainage impacts of project infrastructure such as permeable surfaces for access roads and parking areas;
- Confirm sanitary waste disposal system, and any potential impacts/mitigation measures to local air quality;
- Review options to maximize the aesthetics of project infrastructure such as bridge barriers;
- Potential conflicts with recreational amenities will be re-examined during the detailed design phase, and if required the City of Toronto will be consulted to determine appropriate design solutions to minimize/mitigate effects to recreational amenities;
- Metrolinx will engage the City of Toronto during construction planning to ensure that any municipal concerns are addressed in the construction plans prior to commencement of construction activities;
- Confirm municipal water and sewer connections are adequate to support the Don Valley Layover, and coordinate this work with the City;

- In instances where sanitary sewer connections are required, a Sanitary Sewer Capacity Analysis will be completed at the point of connection, to a sewer trunk;
- If required by City of Toronto, an Infrastructure Matrix Table will be provided during detailed design stage once further details regarding utility conflicts, proposed mitigation, etc. are known.
- Terms of an access agreement between the City of Toronto and Hydro One (sublease) will determine use of the access road during construction and operation for all parties that currently use the existing, informal access to the Prince Edward Viaduct and HONI substation;
- A Construction Staging Plan will be developed to the satisfaction of Metrolinx at each layover facility prior to commencing work at these locations. These Plans will be shared with municipal staff.
- The Construction Staging Plan shall include measures to separate construction and operational traffic from the municipal road network at the entrance to the layover site. Metrolinx shall also demonstrate that the Don Valley layover is designed to accommodate emergency vehicle turnaround in accordance with City of Toronto Standards;
- Metrolinx shall demonstrate that the design of the Don Valley Layover will maintain access for the MECP licensed hauler to the holding tank and sanitary waste disposal building and provides adequate vehicle turnaround;
- An access gate will be provided on the north and south end of the layover facility to allow the City access to the south side of the facility;
- Metrolinx will obtain all required permits and approvals. However, Metrolinx as a Crown Agency of the Province of Ontario is exempt from certain municipal processes and requirements. In these instances, Metrolinx will engage with the municipalities to incorporate municipal requirements as a best practice, where practical, and may obtain associated permits and approvals. Water, sanitary, and storm servicing will be reviewed during detailed design. Metrolinx will consult with the City of Toronto during detailed design to address impacts to municipal water, sanitary, and storm sewer systems. Metrolinx shall continue to communicate and engage with the City of Toronto during detailed design and construction planning to address municipal concerns;
- Landscape planting areas shall have regard for Toronto Green Standard. Where possible, collect water for plant irrigation and include bio-retention or other LID and SWM measures, as appropriate;
- Exterior wall facings that are visible to the public will receive a permanent concrete facing constructed using form liners to create a patterned finish on the exposed face. Metrolinx will consult with the City of Toronto to determine the appropriate finish(es) for the retaining wall based on municipal planning and urban design policies and objectives and surrounding land uses;
- Exposed concrete surfaces will be treated with an anti-graffiti coating;
- A Drainage and Stormwater Management Report, an Erosion and Sediment Control Plan and detailed drainage design and erosion and sediment control drawings will be prepared , implemented and monitored in accordance with the Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual and the Greater Golden Horseshoe's Erosion and Sediment Control Guideline for Urban Construction;
- A screened enclosure for the development site will be provided, with particular attention to the waste disposal and material storage areas;

- A Landscaping and Restoration Plan shall be developed for construction and operation stages that details proposed vegetation screenings;
- The design and specification of vegetative and built screening elements will be undertaken with the objective of mitigating the visual impacts of the facility. Consideration will be given to providing temporary landscaping along the borders of the construction site between site fencing/enclosure and walkways, where space allows, and where necessary;
- Construction activities will be monitored by a qualified Environmental Inspector to confirm that all activities are conducted in accordance with mitigation plans and within specified areas;
- The design and specifications for built structures supporting the operation of the layover shall reflect the park setting in which the layover is being built;
- As part of the detailed design, efforts will be made to minimize visual impacts as much as possible;
- A Design Excellence process will be followed to integrate the new infrastructure design into the existing environment to reduce the extent of visual impacts;
- Metrolinx will mitigate floodplain impacts resulting from the Don Valley Layover site to the extent that is feasible and reasonable;
- The Don Valley layover facility shall be designed to be flood proofed to the 100-year design storm event elevation, as shown in the RCD;
- Minimizing light pollution and light trespass will be key performance metrics of the lighting design for the layover facility;
- Construction and operation of the layover facility shall ensure that lighting be utilized in such a way as to minimize impacts beyond the layover site boundary as per Metrolinx Design Standards for Lighting;
- Metrolinx will comply with all local applicable municipal by-laws and Ministry of Transportation (MTO) practices for lighting in areas near or adjacent to highways and roadways regarding outdoor lighting for both permanent and temporary construction activities, and incorporate industry best practices provided in ANSI/IES RP-8-18 – Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting;
- Lighting design shall:
 - Provide no unnecessary daily lighting for the buildings, minimize impacts to the public and private properties;
 - Lighting controls shall support elimination of light or reduction when not occupied. Lighting controls shall support dimming; and
 - The light source will be placed to eliminate or minimize visibility to adjacent properties and users, such as the public using the trails and park.
- The City of Toronto's multi-use Lower Don Valley Trail will be maintained and reconstructed following construction, if required (if the trail is impacted by project works) to City standards and Toronto Multi-Use Trail Design Guidelines;
- Maintenance activities such as snow clearing will not impact the Lower Don Valley Trail;
- Advance notice of any temporary trail impacts resulting from construction shall be provided to the City of Toronto and public stakeholders at least two weeks prior;

- Signage and fencing shall be provided, as required;
- Physical barriers will be installed during construction and operation as required;
- Coordination with City-led initiatives shall be coordinated with City staff, as required;
- In the event unexpected utility conflicts are encountered during construction, these shall be documented and communicated immediately to Metrolinx and all relevant stakeholders. A field conflict resolution process shall be implemented to mitigate the conflict and shall include input from all relevant stakeholders. Metrolinx shall be notified at the first indication of a delay to their relocation schedule due to the unknown conflict. Metrolinx shall review the impact of the delay on the overall utility relocation plan;
- Sanitary Sewer Capacity Analysis will be completed for areas where sanitary sewer connections are proposed that will ultimately increase the sanitary flow discharge to an existing Basement Flooding Protection Area in accordance with the City's Wet Weather Flow Management Guidelines;
- A Utility Infrastructure Relocation Plan shall include Sanitary Sewer Capacity Analysis in areas where sanitary sewer connections are proposed that will ultimately increase the sanitary flow discharge to an existing Basement Flooding Protection Area;
- Proposed sanitary service connections to be in accordance with Chapter 2 of the City of Toronto Design Criteria for Sewers and Watermains; and
- Flow tests to be carried out as outlined in Chapter 4 of the City of Toronto Design Criteria for Sewers and Watermains, First Edition, 2nd Revision, June 2019.

9.5.7 Town of Oakville

Metrolinx will continue to consult and coordinate with the Town of Oakville during the detailed design/construction phases as follows:

- Consultation with the Town prior to implementing any road closures to avoid/minimize traffic interference to the extent possible.

9.6 Natural Environment

9.6.1 Future Studies/Field Investigations

Further investigations will be identified and carried out as required during detailed design in order to determine the boundaries of natural features associated with the Natural Heritage System (NHS) and within Designated Areas (ANSIs, PSWs), in consultation with MNRF, Toronto Region Conservation Authority (TRCA), Halton Region Conservation Authority (CH), Lake Simcoe Region Conservation Authority (LSRCA), and Central Lake Ontario Conservation Area (CLOCA) in order to accurately confirm potential impacts to these sensitive areas and develop detailed avoidance strategies and/or compensation for losses within these areas.

The following specific future studies were identified at the TPAP stage and will be completed at detailed design to augment the existing characterization of the potential impacts to the natural environment and to inform regulatory compliance during detailed design and construction (e.g., obtaining permits/approvals) as detailed in the Natural Environment Impact Assessment Report (**Appendix B2**) and summarized in Table 9-3. Also refer to EPR Section 9.6.3 which outlines studies specific to Species at Risk.

TABLE 9-3 FUTURE FIELD INVESTIGATIONS – NATURAL ENVIRONMENT

Project Study Area Location	Type of Study	Timing Window
Walkers Line Layover (LSW-4 and LSW-5)	Aquatic Habitat Survey to refine potential harmful alteration, disruption, or destruction of fish habitat (HADD) and inform submission to DFO and Conservation Halton	May 1st to September 30th
	Screening for Butternut Trees	In advance of site clearing
	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Surveys to determine the potential use of the site by SAR bats is recommended only if tree removal can not be accomplished within the recommended timing windows.	The recommended bat survey window is from April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
City of Barrie (BR-14 and BR-15) Allendale GO Station (BR-16) Unionville GO Station (ST-1)	Screening for Butternut Trees	In advance of site clearing
	Surveys to determine the potential use of the site by SAR bats is recommended only if tree removal can not be accomplished within the recommended timing windows. Surveys to determine the potential use of the site by SAR bats and monarch caterpillars, as applicable/if required	The recommended bat survey window is from April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
	Screening for Butternut Trees	In advance of site clearing
	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
	Screening for Butternut Trees	In advance of site clearing
City of Barrie (BR-14 and BR-15) Unionville Storage Yard (ST-1 and ST-2)	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
	Conduct wildlife awareness/management program for SAR turtles	During Construction
Allendale GO Station	Screening for Butternut Trees	In advance of site clearing

Project Study Area Location	Type of Study	Timing Window
(BR-16)	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
Mount Joy GO Station (ST-3 and ST-4)	Conduct wildlife awareness/management program for SAR turtles	During Construction
	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
Thickson Road Bridge Expansion (LSE-2 and LSE-3) Oshawa GO Station (LSE-4)	Screening for Butternut Trees	In advance of site clearing
	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
	Screening for Butternut Trees	In advance of site clearing
Mount Joy GO Station (ST-3 and ST-4) Electrification of the Richmond Hill Corridor (RH-1, RH-2, RH-3, RH-4, RH-5 and RH-6)	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
Thickson Road Bridge Expansion (LSE-2 and LSE-3) Don Valley Layover (RH-3, RH-4 and RH-5)	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A
	Conduct wildlife awareness/management program for SAR turtles	During Construction
	Screening for Butternut Trees	In advance of site clearing
Oshawa GO Station (LSE-4)	Performing vegetation removal outside of typical breeding period for birds and occupation of SAR habitat	The typical bird breeding window is April 1st to September 30th
	Ensure vegetation removal follows general mitigation outlined in the Metrolinx Vegetation Guideline (2020)	N/A

9.6.2 In-Water Works

The following requirements will be adhered to for in-water works:

- Conform with the requirements of the *Navigation Protection Act*;
- Conform with the requirements of the *Fisheries Act*. For any areas identified during Detailed Design that require in or near water works, a Self-Assessment under the *Fisheries Act* will be undertaken by a qualified professional to determine appropriate mitigation measures and to confirm whether further assessment and review is required by Fisheries and Oceans Canada);
- A qualified Fisheries Specialist shall undertake an assessment to determine measures to avoid causing harm to fish and fish habitat, including aquatic species at risk and determine the need for Fisheries and Oceans Canada review;
- All in-water works shall comply with the timing windows identified by MECP/MNRF as/if applicable; and
- Compliance with OPSS 180 (Management of Excess Materials) and OPSS 182 (Environmental Protection for Construction in Waterbodies and on Waterbody Banks) during construction.

9.6.3 Species at Risk

Based on the detailed designs to be prepared for all infrastructures including new tracks, layover facilities, etc., the presence of SAR and/or SAR habitat will need to be confirmed via the appropriate studies and field investigation, and mitigation, monitoring and permitting requirements fulfilled as per applicable law. With this in mind, Table 9-4 outlines the commitments that will be adhered to if SAR / SAR habitat is expected to be impacted by the Project. Sections 9.6.3.1, 9.6.3.2, 9.6.3.3, and 9.6.3.4 outline the specific SAR related commitments that were identified during the TPAP stage.

9.6.3.1 Butternut Trees

The presence/absence of Butternuts will be confirmed during Detail Design. Should any Butternuts be found during Detail Design, a health assessment (to be completed by a qualified Butternut Assessor) will be required for any pure butternuts and appropriate approvals under the ESA, 2007 obtained. Dependent on number of individuals found and their conditions, this may include a registration process or permit. Protective measures for any Butternuts within 50 metres of the construction footprint that do not need to be removed, shall be implemented.

9.6.3.2 Bats

Species at Risk bat habitat will be confirmed as part of more detailed studies that will be completed during detailed design, including snag/cavity tree density surveys which will be completed during leaf-off seasons prior to construction. Where forested communities require vegetation removals, further studies (e.g., maternity roost surveys, and acoustic monitoring) may be required to confirm the presence/absence of Species at Risk bat habitat. Where Species at Risk bat habitat is confirmed during detailed design, consultation with the MECP/MNRF will be required to determine the appropriate approval or permitting requirements. Specifically, as part of detailed design and permitting, Bat Protocol will be discussed with MECP/MNRF in relation to applicability and preferred approach for any required permits/approval as it relates to the Electrification Project works. Any required MECP/MNRF permits/approval will be obtained prior to project implementation.

Where vegetation removal in Significant Bat Maternity Colony Habitat is confirmed through snag/cavity tree density surveys, vegetation removal activities will be scheduled to occur outside of the bat roosting season of April 30^h to September 1st and strictly cannot occur during the bat maternity period of June 1st to July 31st. If this is not possible, tree removal could occur outside of the bat maternity period in confirmed Significant Bat Maternity Colonies provided that exit surveys and/or acoustic monitoring are

completed 24 hours prior to vegetation removal to ensure suitable cavity trees are not occupied by maternity colonies.

9.6.3.3 Barn Swallow

Prior to any bridge works, surveys to determine the presence/absence of barn swallow nests will be required. Where Barn Swallow nests are identified, consultation with the MECP/MNRF (i.e., completion of Notice of Activity registration) will be required.

9.6.3.4 Migratory Bird Species

Where removal of vegetation and works on bridges cannot occur outside of the breeding bird window (April 1st to August 31st), consultation with Environment and Climate Change Canada's Canadian Wildlife Service office is required. The mitigation measures as outlined in Table 9-4 will be implemented and adhered to in order to reduce or mitigate the potential for adverse effects on birds and their nests:

TABLE 9-4 SUMMARY OF SPECIES AT RISK COMMITMENTS FOR DETAILED DESIGN & CONSTRUCTION

Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
Species at Risk (SAR)			
General	Habitat loss, disturbance and/or mortality to SAR.	<ul style="list-style-type: none"> All requirements of the <i>Endangered Species Act</i> (ESA) and <i>Species at Risk Act</i> (SARA) will be met. Species-specific mitigation measures will be implemented based on any recommended studies undertaken prior to construction, and consultation with MECP/MNRF. If SAR is present and conservation strategies have been developed by MNRF/MECP, the Contractor will follow the commitments in the recover strategy. On-site personnel will be provided with information (e.g., factsheets) that address the existence of potential SAR on-site, the identification of the SAR species and the procedure(s) to follow if an individual is encountered or injured. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Species-specific monitoring activities will be developed in accordance with any registration and/or permitting requirements under the ESA.
Barn/Bank Swallow	Habitat loss, disturbance and/or mortality to Barn and/or Bank Swallow.	<ul style="list-style-type: none"> Field surveys will be undertaken prior to construction to confirm the number of nests present at the known locations and whether the nests remain active. Where loss or disturbance cannot be avoided (e.g., due to work on bridges or banks), all requirements under the ESA will be met, including any registration, compensation, replacement structures and/or permitting requirements. If construction activities are scheduled during the nesting season for Barn and/or Bank Swallow (April 1st to August 31st), a nest search will be undertaken by a qualified biologist to confirm that no Barn and/or Bank Swallow are nesting on structures or banks that may be affected by construction activities on or near these areas. If possible, the area will be netted prior to nesting season to dissuade use of these areas for nesting. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
Chimney Swift	Habitat loss, disturbance and/or mortality to Chimney Swift.	<ul style="list-style-type: none"> If repair, maintenance or demolition of buildings/structures with suitable roosting/nesting habitat (e.g., chimneys) is to take place, targeted surveys for Chimney Swift will be completed by a qualified biologist as per the Bird Studies Canada Chimney Swift Monitoring Protocol (2009). Repair, maintenance, or demolition of an identified roosting/nesting structure may constitute destruction of critical habitat and would be discussed in advance with the MECP and requirements of the ESA will be met. Register activities for Chimney Swift under the ESA and consult with MECP to fulfil requirements the ESA and its associated regulations. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
Migratory Breeding Birds and Nests	Disturbance or destruction of migratory birds and/or nests.	<ul style="list-style-type: none"> Vegetation shall be inspected for nests and eggs prior to maintenance activities. Nests and eggs of protected migratory birds shall not be destroyed during migratory bird nesting season (April 1st to August 31st) to avoid a permit under the Migratory Birds Convention Act. If an active nest of a migratory bird must be damaged or destroyed, a permit under this Act is required. During construction, should vegetation removals be required within the migratory bird window of April 1st to August 31st, a survey for migratory bird nests (including SAR) will be required prior to any vegetation removals. Should vegetation removals be required within the period from April 1st to August 31st, a nesting survey protocol shall be developed and implemented prior to any vegetation removals. All active nests of birds protected by the Act shall not be removed at any time. If inactive nests are removed from structures prior to the breeding bird window (April 1st to August 31st), the bridge structure should be netted or tarped to prevent the recurrence of nesting activity, the bridge should be monitored daily for any new nests. Nests and eggs of protected Species at Risk birds shall not be destroyed at any time. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
SAR Bats	Habitat loss, disturbance and/or mortality to SAR Bats.	<ul style="list-style-type: none"> Disturbance to bat roosting habitat will be avoided during the bat roosting period of April 1st to September 30th accordance with MECP requirements. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
Aquatic SAR	Habitat loss, disturbance and/or mortality to aquatic SAR.	<ul style="list-style-type: none"> Specific mitigation measures identified through the Aquatic Habitat and Fish Community Assessment, and/or any other studies, will be implemented. If aquatic SAR is present, design and construction will occur in accordance with MECP requirements. Register activities that fall under the notice of activity for aquatic species for works within habitat of certain fish or mussels. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
SAR Turtles	Habitat loss, disturbance and/or mortality to SAR turtles.	<ul style="list-style-type: none"> In areas identified as being potential SAR turtle habitat, in-water works will be scheduled to occur outside of the turtle overwintering period of October 1st to April 30th in any given year and in accordance with MECP requirements. Prior to in-water works, in areas identified as being potential SAR turtle habitat, an inspection for turtles will be conducted. If a nesting turtle is found, the MECP will be notified immediately, a suitable buffer zone will be flagged around the site, and that area will be protected from harm during the nesting season. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.
SAR Snakes	Habitat loss, disturbance and/or mortality to SAR snakes.	<ul style="list-style-type: none"> Please refer to the "Wildlife" environmental component within this table for applicable general mitigation measures. 	<ul style="list-style-type: none"> On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts. Additional monitoring measures will be developed with the MECP, if required.

9.6.4 Wildlife and Wildlife Habitat

The following measures will be adhered to in the event that disturbance, displacement or mortality of wildlife is anticipated as a result of the design or construction of the Project:

- Prior to construction, investigation of the project footprint for wildlife and wildlife habitat that may have established following the completion of previous surveys will be undertaken, as appropriate;
- If wildlife is encountered, measures will be implemented to avoid destruction, injury, or interference with the species, and/or its habitat. For example, construction activities will cease or be reduced and wildlife will be encouraged to move offsite and away from the construction area on its own. A qualified biologist will be contacted to define the appropriate buffer required from wildlife; and
- On-site inspection will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required. Corrective actions may include additional site maintenance and alteration of activities to minimize impacts.

9.6.5 Migratory Breeding Birds and Nests

The following measures will be adhered to if disturbance or destruction of migratory bird nests is anticipated as a result of the design or construction of the Project:

- All works must comply with the *Migratory Birds Convention Act* (MBCA), including timing windows for the nesting period (April 1st to August 31st in Ontario);
- If activities are proposed to occur during the general nesting period a breeding bird and nest survey will be undertaken prior to required activities. Nest searches by an experienced searcher are required and will be completed by a qualified biologist no more than 48 hours prior to vegetation removal; and
- If a nest of a migratory bird is found outside of this nesting period (including a ground nest) it still receives protection.

9.6.6 Integrated Vegetation Management (IVM)

Prior to commencement of construction, an Integrated Vegetation Management (IVM) Plan will be developed that adheres to the Metrolinx Vegetation Guideline (2020) and will be approved by Metrolinx. The Guideline's selection criteria will be used to assess the vegetation present as compatible or incompatible, and manage it, if necessary, in a way which meets safety needs in a timely manner, is sensitive to environmental conditions, and maximizes cost-effectiveness.

The presence, density, and location of compatible and incompatible species will be monitored as per the frequency and methodology established in the Bi-Annual Monitoring Program consistent with the Metrolinx Vegetation Guideline (2020). The Bi-Annual Monitoring Program will be made up of pre-treatment and post-treatment monitoring events that will be carried out via field, aerial, and high-rail vehicle or train surveys conducted by qualified specialists.

9.6.7 Vegetation Removals & Compensation Plan

In addition to the mitigation and monitoring measures outlined in Chapter 7 of this EPR, the following commitments will be adhered to with respect to any project activities that involve tree / vegetation removals, injury and/or protection.

- If a tree requires removal or injury, compensation and permitting/approvals (as required) will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020);
- Prior to the undertaking of tree removals, a Tree Removal Strategy, building upon the considerations and elements set out in the Metrolinx Vegetation Guideline (2020), will be

developed and implemented in adherence with best practices, standards and regulations on safety, environmental and wildlife protections;

- Compensation for tree/vegetation removals will be undertaken in accordance with Metrolinx's Vegetation Guideline (2020);
- Vegetation removals will also consider and mitigate potential impacts to sensitive species, e.g., migratory birds and Species at Risk (SAR), and features, e.g., Designated Natural Areas and Significant Wildlife Habitat. Refer to Natural Environment commitment tables for additional details;
- Removal of ash trees, or portions of ash trees, will be carried out in compliance with the Canada Food and Inspection Agency Directive D-03-08: Phytosanitary Requirements to Prevent the Introduction into and Spread within Canada of the Emerald Ash Borer, *Agrilus planipennis* (Fairmaire) (2014), as amended from time to time. To comply with this Directive, all Ash trees requiring removal, including any wood, bark or chips, will be restricted from being transported outside of the emerald ash borer regulated areas of Canada;
- Complete Arborists reports/additional study requirements as detailed below in Section 9.6.7.1;
- The success of vegetation compensation activities will be monitored in accordance with Metrolinx's Vegetation Guideline (2020). The approach to compensation monitoring will be determined by property ownership, applicable governing bylaws/regulations and location with respect to ecological functioning;
- Monitoring requirements will be undertaken in accordance with conditions of permits and approvals; and
- Monitoring and management of trees/vegetation within the rail corridor right-of-way will be undertaken in accordance with the IVM Program developed under Metrolinx's Vegetation Guideline (2020).

9.6.7.1 Arborist Reports

- An Arborist Report will be prepared which meets regulatory requirements and is completed by an I.S.A. Certified Arborist. The report will also be completed with regard to the *Ontario Forestry Act R.S.O. 1990*, the Metrolinx Vegetation Guideline (2020), the *Endangered Species Act*, and other regulations, municipal by-laws and best management practices as applicable;
- The Arborist Report will include, but not be limited to, the individual identification of all trees within the Project Study Area including those that require removal or preservation, or trees that may be injured as a result of the Project. Trees to be identified within the Project Study Area will include those on Metrolinx property, trees on public and private lands, and boundary trees. For trees that are not within Metrolinx owned lands consideration must be given to applicable Municipal by-laws to dictate the minimum Diameter at Breast Height (DBH) which requires inventory and additional requirements for tree inventories and tree protection plans. For trees within Metrolinx owned lands the Vegetation Guideline (2020) is to be followed. As part of the Arborist Report, all trees within or adjacent to the Project Footprint that will be removed or injured as part of the Project will be inventoried, including Butternut and any other SAR tree; and
- Each Butternut that may potentially be removed or impacted must be assessed by a qualified Butternut Health Assessor, in accordance with MNR's *Butternut Assessment Guidelines* (2014). The Assessor will prepare a Health Assessment Report for submission to MECP to determine the next course of action.

9.6.8 Invasive Species

The following mitigation measures will be followed to deal with invasive species:

- Where possible, excavated soils should be stored for a period of less than 45 days;
- Where excavated soils must be stored for a period longer than 45 days, they should be covered or seeded with a cover crop, such as annual oats or Canada Wild Rye;
- Once soils are replaced, they should be re-seeded with a native seed mix suited to the site conditions;
- Equipment should be cleaned between sites to prevent the spread of invasive species; and
- Vegetation removals of Ash trees must be carried out in a manner in compliant with the Ministerial Order issued by the Federal Government which identifies prohibitions and restrictions of movement on trees, leaves, logs, lumber, wood/wood chips from all ash species. Unless authorized by a Movement Certificate issued by the Canadian Food Inspection Agency (CFIA), moving these products out of the Regulated Area is prohibited. This is necessary to prevent the spread of the Emerald Ash Borer (EAB) to un-infested areas in other parts of Ontario and Canada. The Contractor must dispose of all wood at a registered Waste Facility.

9.7 Hydrogeology/Groundwater

A Groundwater Monitoring Plan (GMP) will be developed prior to construction to guide the handling, management, and disposal of groundwater encountered during the works. The GMP will comply with *Ontario Regulation 406/19* (On-Site and Excess Soil Management – enacted into law on July 1, 2020), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*.

The GMP will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the Works and in accordance with applicable regulatory requirements and the project contract documents/agreement as applicable. The GMP will outline general groundwater monitoring considerations during the Works and provide guidance for groundwater monitoring following the Works where considered applicable. The GMP will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the Works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) from the MECP, or an Environmental Activity Sector Registry (EASR). The GMP will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the Works, and approvals for the water disposal, and or treatment if applicable based on the quantity and quality.

The Groundwater Management and Dewatering Plan will be reviewed and approved by Metrolinx prior to construction. The following monitoring commitments will also be complied with and implemented:

- A Groundwater Management Monthly Dashboard Report will be developed by the Contractor for Metrolinx's review to document performance monitoring data/results and any corrective actions implemented during the previous month; and
- Upon completion of the work, the Contractor will submit a Groundwater Management and Dewatering Implementation Report to Metrolinx.

9.8 Excavated Materials

A Soil and Excavated Materials Management Plan will be developed for the handling, management and disposal of all excavated material (i.e., soil, rock and waste) that is generated or encountered during the work. The plan will be overseen by a Qualified Person pursuant to *Ontario Regulation 153/04* under the *Environmental Protection Act* (QP) and will comply with *Ontario Regulation 406/19* (On-Site and Excess

Soil Management – enacted into law on July 1, 2020), the Ministry of the Environment, Conservation and Parks (MECP), formerly the Ministry of the Environment and Climate Change (MOECC)'s Management of Excess Soils: A Guide for Best Management Practices (April 2019, as amended) and all Applicable Law. The plan will describe how to address the management of the excavated materials, imported materials, contaminated materials, and impacted railway ties, including handling, transportation, testing, documentation and reuse and disposal of excavated materials generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement, as applicable. Additional mitigation includes:

- Non-soil materials, including railway bedding, railway ties, or ballast materials encountered during the earthworks will also require waste classification as documented by testing where applicable to determine management and disposal requirements as per *Ontario Regulation 347* (as amended) and all Applicable Law;
- The Soil and Excavated Materials Management Plan will be reviewed and approved by Metrolinx prior to construction;
- Develop a Groundwater Management and Dewatering Plan to guide the handling, management, and disposal of groundwater encountered during the works. The Groundwater Management and Dewatering Plan will be overseen by a QP and will comply with Ontario Regulations 406/19 (On-Site and Excess Soil Management – enacted into law on July 1, 2020), 64/16 and 387/04, as amended under the *Ontario Water Resources Act*;
- The Groundwater Management and Dewatering Plan will describe the handling, transfer, testing, monitoring, disposal of groundwater generated as part of the works and in accordance with applicable regulatory requirements and the Project Agreement. The Groundwater Management and Dewatering Plan will outline general groundwater monitoring considerations during the works and provide guidance for groundwater monitoring following the works where considered applicable;
- The Groundwater Management and Dewatering Plan will describe the anticipated groundwater quantity and dewatering Zone of Influence that will be encountered during the works, and if approvals are needed for the water taking, such as a Permit to Take Water (PTTW) or an Environmental Activity Sector Registry (EASR) from the MECP;
- The Groundwater Management and Dewatering Plan will describe the storage, transfer, and disposal and or treatment of the groundwater collected during the works, and approvals for the water disposal, and/or treatment if applicable, based on the quantity and quality' and
- The Groundwater Management and Dewatering Plan will be reviewed and approved by Metrolinx prior to construction.

9.9 Land Use/Socio-Economic

Refer to Section 9.3.4 outlining commitments related to Municipal permits and specific Municipal commitments.

9.10 Visual/Aesthetics

Based on the Visual Impact Assessment study and conceptual design prepared as part of the TPAP (refer to **Appendix E2**), areas of special aesthetic consideration were identified. These areas were classified as high or moderate visual impact areas within the Study Area, as listed below. Special consideration will be given to these areas during detailed design, as outlined in the subsections below, to enhance the aesthetic aspects of the proposed infrastructure wherever possible.

9.10.1 Areas Adjacent to Metrolinx Rail Corridors

Areas classified as high or moderate potential visual impact areas along the rail corridors through the Visual Impact Assessment Report (see **Appendix E2**) have been summarized in Table 9-5.

TABLE 9-5 AREAS OF SPECIAL VISUAL/AESTHETICS CONSIDERATION ALONG RAIL CORRIDORS

Corridor	High Potential Visual Impact	Moderate Potential Visual Impact
Lakeshore West (LSW)	<ul style="list-style-type: none"> Areas where there are scenic views or scenic and natural areas that will be altered. <ul style="list-style-type: none"> See Map LSW-4 and LSW-5 	<ul style="list-style-type: none"> None
Kitchener (KT)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
Barrie (BR)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
Stouffville (ST)	<ul style="list-style-type: none"> None 	<p>Future proposed development, which may include:</p> <ul style="list-style-type: none"> Areas where high-rise buildings in a natural setting are closer than 30 metres to the ROW; and Residential areas where homes are between 8 and 20 metres away from the proposed infrastructure. <ul style="list-style-type: none"> See Map ST-1 and ST-2 Areas where there are scenic views or scenic and natural areas that will be altered. <ul style="list-style-type: none"> See Map ST-3 and ST-4
Lakeshore East (LSE)	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> Areas where high-rise buildings in a natural setting are closer than 30 metres to the ROW. <ul style="list-style-type: none"> See Map LSE-1
Richmond Hill (RH)	<ul style="list-style-type: none"> Residential areas where homes are within 8 metres of the proposed infrastructure. <ul style="list-style-type: none"> See Map RH-1 and RH-2 Environmental protected and natural areas directly adjacent to the proposed infrastructure. <ul style="list-style-type: none"> See Map RH-1, RH-2, RH-3, RH-4 and RH-5 Scenic, cultural or historic features/environments directly adjacent to the proposed infrastructure (Prince Edward Viaduct). <ul style="list-style-type: none"> See Map RH-4 	<ul style="list-style-type: none"> Areas where there are scenic views or scenic and natural areas that will be altered. <ul style="list-style-type: none"> See Map RH-1 Areas where high-rise buildings in a natural setting are closer than 30 metres to the ROW. <ul style="list-style-type: none"> See Map RH-2

9.10.2 New Layover/Storage Yard Facilities

The installation of Layover/Storage Yard Facilities have potential to affect views within the surrounding area, particularly where vegetation/tree clearing is required or where there are no existing obstructions. However, in cases where a facility is proposed within the vicinity of residential/natural areas and/or other visually sensitive areas, landscaping and/or screening may be implemented around the facility. These specific locations include:

- Walkers Line Layover (Lakeshore West rail corridor, within the City of Burlington);
- Unionville Storage Yard (Stouffville rail corridor, within the City of Markham); and

- Don Valley Layover (Richmond Hill rail corridor, within the City of Toronto).

There are certain types of screening measures that may be considered to mitigate/reduce the visual impact of a layover/storage yard facility, such as fencing, use of locally-sourced or significant building materials (e.g., clay brick cladding), and/or vegetative buffers, where suitable/feasible with surrounding land uses. Metrolinx will continue to engage relevant municipalities during the detailed design phase to determine the feasibility and need for visual mitigation measures for the above noted facilities.

9.10.3 OCS Infrastructure - Richmond Hill Corridor

The installation of OCS infrastructure will affect the viewshed along the rail corridor, particularly in areas of vegetation/tree clearing and applicable bridge attachments. Therefore, engineering design strategies for OCS will be identified and incorporated into the design process, where feasible. These strategies will address the range of visual conditions, area allocations, and mitigation needs that will be found along the corridor.

Refer to EPR Chapter 5 for further details regarding potential visual impacts.

9.10.4 Electrification Protection Bridge Barriers - Richmond Hill Corridor

All overhead and pedestrian bridges will require bridge barriers for safety, which may affect views across the bridge. Therefore, during detailed design Metrolinx will determine the preferred bridge barrier designs; as part of this, barrier designs that maintain existing views will be considered and implemented where possible. In addition, a Design Excellence process will review options for design treatments/options for enhancing the aesthetics of bridge barriers for various categories of bridges in consultation with interested/affected municipalities as appropriate. All bridges will be categorized based on common characteristics to ensure consistency in the approach to determining final design of bridge barriers. As part of detailed design, Metrolinx's Design Excellence Committee will be engaged to review possible design treatments/option for enhancing the aesthetics of bridge barriers where feasible/required. It is anticipated that the basis of the protection barrier will be a post and panel (solid-faced) design with customizable panels toward suiting visual preferences (in consultation with the applicable bridge owners as appropriate), such as:

- Multilane, restricted access highways and non-visually sensitive locations;
- Visually sensitive locations; and
- Structures of heritage value or sensitivity.

9.11 Cultural Heritage Resources

9.11.1 Cultural Heritage Monitoring & Commitments – Design, Construction, & Operation

Table 9-6 outlines the commitments that will be followed and adhered to by Metrolinx (or their Contractor) following the TPAP:

TABLE 9-6 MITIGATION AND MONITORING COMMITMENTS – CULTURAL HERITAGE

Environmental Component	Potential Effect/Design Component or Activity	Mitigation Measure(s)	Monitoring
Built Heritage Resources and Cultural Heritage Landscapes	Indirect or direct impacts to the heritage attribute(s) of a property of known or potential Cultural Heritage Value or Interest (CHVI) due to installation of new/modified infrastructure	<ul style="list-style-type: none"> All work shall be performed in accordance with Applicable Law, including but not limited to the <i>Ontario Heritage Act</i>, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) <i>Standards and Guidelines for Provincial Heritage Properties: Identification and Evaluation (I&E) Process</i> (2014), the MHSTCI guidance on <i>Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment</i> (2019) and the forthcoming <i>Standards and Guidelines for Provincial Heritage Properties: Metrolinx Identification and Evaluation (I&E) Process</i> (2020). In the event that the Metrolinx I&E Process is not approved, follow the Metrolinx <i>Interim Cultural Heritage Management Process</i> (2013). Follow the process and recommendations outlined in the Environmental Project Reports (EPR) under Transit Project Assessment Process (TPAP) for Proponents and their Consultants. Follow the recommendations outlined in the heritage reporting completed including the Cultural Heritage Report and/or the Heritage Impact Assessment (HIA). For known and potential properties of Cultural Heritage Value or Interest (CHVI) that will experience indirect or direct impacts and where no previous assessment has been completed or a Statement of Cultural Heritage Value (SCHV) has not been approved by Metrolinx, undertake a Cultural Heritage Evaluation Report (CHER) as per the forthcoming Metrolinx I&E Process (2020). In the event that the Metrolinx I&E Process (2020) is not approved, follow the Metrolinx Interim Cultural Heritage Management Process (2013). Given the importance and location of some Cultural Heritage Resources, consultation with Municipal heritage staff and other jurisdictions will be undertaken as appropriate to determine if proposed infrastructure will be subject to specific policies within heritage districts or conservation areas (including parks). 	<ul style="list-style-type: none"> Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or Environmental Study Reports (ESRs) and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, Cultural Heritage Assessment Reports (CHARs), CHERs, HIAs and Strategic Conservation Plans (SCPs).
	Direct impacts to the heritage attribute(s) of a known or potential Provincial Heritage Property (PHP) or Provincial Heritage Properties of Provincial Significance (PHPPS) due to installation of new/modified infrastructure	<ul style="list-style-type: none"> Where no previous assessment has been completed or a Statement of Cultural Heritage Value has not been approved by Metrolinx, undertake a CHER as per the forthcoming Metrolinx I&E Process (2020). In the event that the Metrolinx I&E Process (2020) is not approved, follow the Metrolinx Interim Cultural Heritage Management Process (2013). If warranted, complete a HIA in accordance with MHSTCI <i>Information Bulletin No. 3: Heritage Impact Assessments for Provincial Heritage Properties</i> (2017) to identify alternatives and mitigation and monitoring commitments to avoid or lessen impacts on the Cultural Heritage Value and heritage attributes of the PHP, based on the PHP's Statement of Cultural Heritage Value (SCHV). Mitigation measures and alternatives should be consistent with the relevant conservation strategies established and adopted in a SCP. A SCP will be prepared and implemented for PHPs and PHPPS. Approval will be obtained from the MHSTCI, for any modifications to Provincially Significant properties prior to construction. During design, the recommendations of all HIAs and Cultural Heritage Reports will be followed and adhered to during design and construction, including but not limited to strategies to protect heritage attributes. If the project study limits change or there is a change in impact that is not captured or documented in previously completed Metrolinx and/or GO Transit EPRs and/or ESRs post EA/TPAP, and which causes any additional heritage properties to be impacted by the proposed design/infrastructure, all applicable legislation will be followed to carry out additional impact assessment work and heritage studies to identify any known or potential built heritage resources and cultural heritage landscapes, and to identify potential impacts and appropriate mitigation measures. Given the importance and location of some Cultural Heritage Resources, consultation with Municipal heritage staff and other jurisdictions will be undertaken as appropriate to determine if proposed infrastructure will be subject to specific policies within heritage districts or conservation areas (including parks). 	<ul style="list-style-type: none"> Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs.
	Potential indirect impacts on known or potential properties of CHVI resulting from construction activities	<ul style="list-style-type: none"> Selection of construction staging and laydown areas will follow Metrolinx's selection procedures which include avoiding heritage attributes wherever possible or effectively mitigating impacts where not possible. 	<ul style="list-style-type: none"> Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs.
	For any additional potentially affected Cultural Heritage Resources/properties not previously identified within a previous Metrolinx/GO Transit EA/TPAP/Other Study	<ul style="list-style-type: none"> If the project study limits change or there is a change in impact that is not captured or documented in previously completed Metrolinx and/or GO Transit EPRs and/or ESRs post EA/TPAP, and which causes any additional heritage properties to be impacted by the proposed design/infrastructure, all applicable legislation will be followed to carry out additional impact assessment work and heritage studies to identify any known or potential built heritage resources and cultural heritage landscapes, and to identify potential impacts and appropriate mitigation measures. 	<ul style="list-style-type: none"> Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs.
	Management of Cultural Heritage Resources/Properties	<ul style="list-style-type: none"> Develop and implement a SCP that addresses built heritage resources and cultural heritage landscapes according to MHSTCI <i>Information Bulletin No. 2: Preparing Strategic Conservation Plans for Provincial Heritage Properties</i> (2017) and as outlined in the Project Agreement. For PHPPS, approval of the MCP and SCP by MHSTCI is required. 	<ul style="list-style-type: none"> Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the

Environmental Component	Potential Effect/Design Component or Activity	Mitigation Measure(s)	Monitoring
			recommendations contained in any/all of the following documents: CHARs, CHERs, HIAs and SCPs.
	Demolition, removal, or relocation of a Metrolinx PHPPS (part or whole)	<ul style="list-style-type: none">In the case of properties identified as PHPPS and where the proposed project infrastructure will require demolition or removal and/or transfer out of provincial control, Metrolinx will need to obtain MHSTCI Minister's consent.The Minister's Consent Package will be prepared which meets MHSTCI requirements and satisfy Metrolinx's obligations under the <i>Ontario Heritage Act</i>.	<ul style="list-style-type: none">Implement and comply with monitoring requirements and commitments pertaining to Cultural Heritage Resources/properties as per previously completed Metrolinx and/or GO Transit EPRs and/or ESRs and Addenda and the recommendations contained in any/all of the following documents: Cultural Heritage Reports, CHARs, CHERs, HIAs and SCPs.

9.11.2 Additional Studies

Based on the cultural heritage studies completed as part of the TPAP, the following additional studies have been identified:

TABLE 9-7 SUMMARY OF RECOMMENDED CULTURAL HERITAGE STUDIES

Corridor	Segment	Mile	Reference # & Address	Result of CHR	Recommended Assessment
Richmond Hill	RH-01	Mile 1.60 to Mile 2.15	#RH-01 (Queen Street East Bridge, Toronto, Mile 1.98)	Potential BHR – Identified during field review	CHER
	RH-02	Mile 2.15 to Mile 2.50	#RH-02 (Dundas Street East Bridge, Toronto, Mile 2.26)	Potential BHR – Identified during field review	CHER
	RH-02	Mile 2.15 to Mile 2.50	#RH-03 (Gerrard Street East Bridge, Toronto, Mile 2.45)	Potential BHR – Identified during field review	CHER
	Don Valley Layover RH-04	Mile 3.10 to Mile 3.60 and Retaining Wall	#RH-06 (Prince Edward Viaduct, Bloor Street Bridge, Toronto, Mile 3.31)	Known BHR – Part IV Designation under the OHA (By-law 387-88)	HIA (to be conducted after TPAP)

9.11.3 Cultural Heritage Evaluation Report (CHER) Recommendations

As identified in the Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment - Volume 2: Impact Assessment (see **Appendix F2**), electrification of the Richmond Hill Corridor will result in direct impacts to three bridges, identified as potential BHRs. These bridges include the Queen Street East Bridge (Structure 245), the Dundas Street East Bridge (Structure 042), and the Gerrard Street East Bridge (Structure 244), all of which carry municipal roadways over the Bayview Avenue Extension, the Richmond Hill rail corridor, the Lower Don River Trail, the Don River, and the Don Valley Parkway (see Figure 9-1).



FIGURE 9-1 LOCATION OF THE SUBJECT BRIDGES IN THE CITY OF TORONTO, ONTARIO

Potential impacts to the subject bridges include proposed attachment of wires (i.e., OCS) to the structures, and the addition or modification of bridge protection barriers. In order to preserve the cultural heritage value/attributes of the three subject bridges, the following recommendations will be followed and adhered to during detailed design/construction of the OCS and bridge protection barriers:

- OCS Attachments should be compatible with the bridge's type and massing and to minimize material interventions;
- Place OCS attachments at edges of the bridge and use materials/finishes to make the new infrastructure physically and visually compatible with, but subordinate to and distinguishable from, the bridge;
- Limit the number of connections and interventions;
- All interventions should be designed to be reversible. Where interventions are undertaken that will result in alterations to material and fabric, documentation should be undertaken in advance of installation activities for future removal; and
- Implement mitigation measures outlined in Section 9.10.3 and 9.10.4.

For further information about the Cultural Heritage Evaluation of the Richmond Hill Rail Corridor Bridges (City of Toronto), see **Appendix F3**.

9.11.4 Vibration Monitoring

Construction activities associated with the installation of track infrastructure may result in limited and temporary adverse vibration impacts to known and potential BHRs. To ensure the BHRs are not adversely impacted during construction, baseline vibration monitoring should be undertaken in advance of construction. Should this advance monitoring assessment conclude that the structure/property will be subject to vibration impacts, and avoidance is not feasible, a qualified engineer should undertake a conditions assessment of the structures within the vibration zone of influence. Further, commitments to repair any damages caused by vibrations will be considered and implemented, as appropriate.

9.12 Archaeological Resources

9.12.1 General

The following general archaeological mitigation measures will be adhered to and implemented:

- All work shall be performed in accordance Applicable Law, including but not limited to the *Ontario Heritage Act*, the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI), formerly the Ministry of Tourism, Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists (2011), and the MHSTCI document, Engaging Aboriginal Communities in Archaeology: A Draft Bulletin for Consultant Archaeologists in Ontario (2011);
- Applicable recommendations for additional work from completed Archaeological Assessment Reports will be implemented and complied with;
- In the event that archaeological resources are encountered or suspected of being encountered during construction, all work will cease. The location of the findspot should be protected from impact by employing a buffer in accordance with requirements of the MHSTCI. A professionally licensed archaeologist will be consulted to complete the assessment. If resources are confirmed to possess cultural heritage value/interest then they will be reported to the MHSTCI, and further Archaeological Assessment of the resources may be required. If it is determined that there is a potential for Indigenous artifacts, Metrolinx should be contacted, and Applicable Law will be followed;
- If final limits of the project footprint are altered and fall outside of the assessed study area (see **Appendix G**), additional Archaeological Assessments will be conducted by a professionally licensed archaeologist prior to disturbance and, prior to construction activities. This will include completing all required Archaeological Assessments resulting from the Stage 1 Archaeological Assessment (Stage 2, Stage 3 and Stage 4, as required) as early as possible, prior to the completion of design, and in advance of any ground disturbance;
- For areas determined to have archaeological potential or contain archaeological resources that will be impacted by project activities, additional stages Archaeological Assessment will be conducted by a professionally licensed archaeologist as early as possible during detail design and prior to any ground disturbing activities;
- All outstanding Archaeological Assessment Report(s) will be submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industries, a letter will be issued by the ministry

acknowledging the report's recommendations and stating that it has been entered into the Ontario Public Register of Archaeological Reports;

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*;
- Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, nor may artifacts be removed from them, except by a person holding an archaeological license; and
- Implement all mitigation measures outlined in this EPR.

9.12.2 Previously Undocumented Archaeological Resources

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

9.12.3 Discovery of Human Remains

If human remains are encountered or suspected of being encountered during project work, all activities must cease immediately and the local police/coroner as well as the Bereavement Authority of Ontario on behalf of the Ministry of Government and Consumer Services must be contacted. Archaeological investigations of human remains will not proceed until police have confirmed the remains are not subject to forensic investigation. Once human remains have been cleared of police concern, the MHSTCI will also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the *Ontario Heritage Act*. If the human remains are determined to be of Indigenous origin, Metrolinx should be contacted, and all applicable law must be adhered to.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

9.12.4 Engagement with Indigenous Communities

All Archaeological Assessment findings have been or will be shared with Indigenous communities, as per Metrolinx's procedures.

9.12.5 Stage 2 Archaeological Assessment Studies

The following Stage 2 Archaeological Assessment Studies were identified through the TPAP studies undertaken to date and will be completed as early as possible during detail design and prior to commencement of construction.

TABLE 9-8 SUMMARY OF FURTHER ARCHAEOLOGICAL ASSESSMENT RECOMMENDED

Corridor	Infrastructure Proposed	Segment	Next Assessment Steps
Lakeshore West	Walkers Line Layover	LSW-4 and LSW-5	Stage 2 Test Pit Survey
Barrie	Track	BR-14	Stage 2 Test Pit Survey
Richmond Hill	Don Valley Layover	RH-3, RH-4 and RH-5	Stage 2 Test Pit Survey

At the time of preparing this EPR, a Stage 2 Archaeological Assessment has been completed for the sites listed in Table 9-8 above. No archaeological resources were encountered during the course of the Stage 2 Test Pit Surveys; therefore, no further archaeological assessment is recommended/required (see Figure 9-2 to Figure 9-4 below).

Should the proposed work extend beyond the current Study Area, or should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands are subject to a Stage 2 Archaeological Assessment.



FIGURE 9-2 STAGE 2 ASSESSMENT RESULTS – WALKERS LINE LAYOVER (CITY OF BURLINGTON)

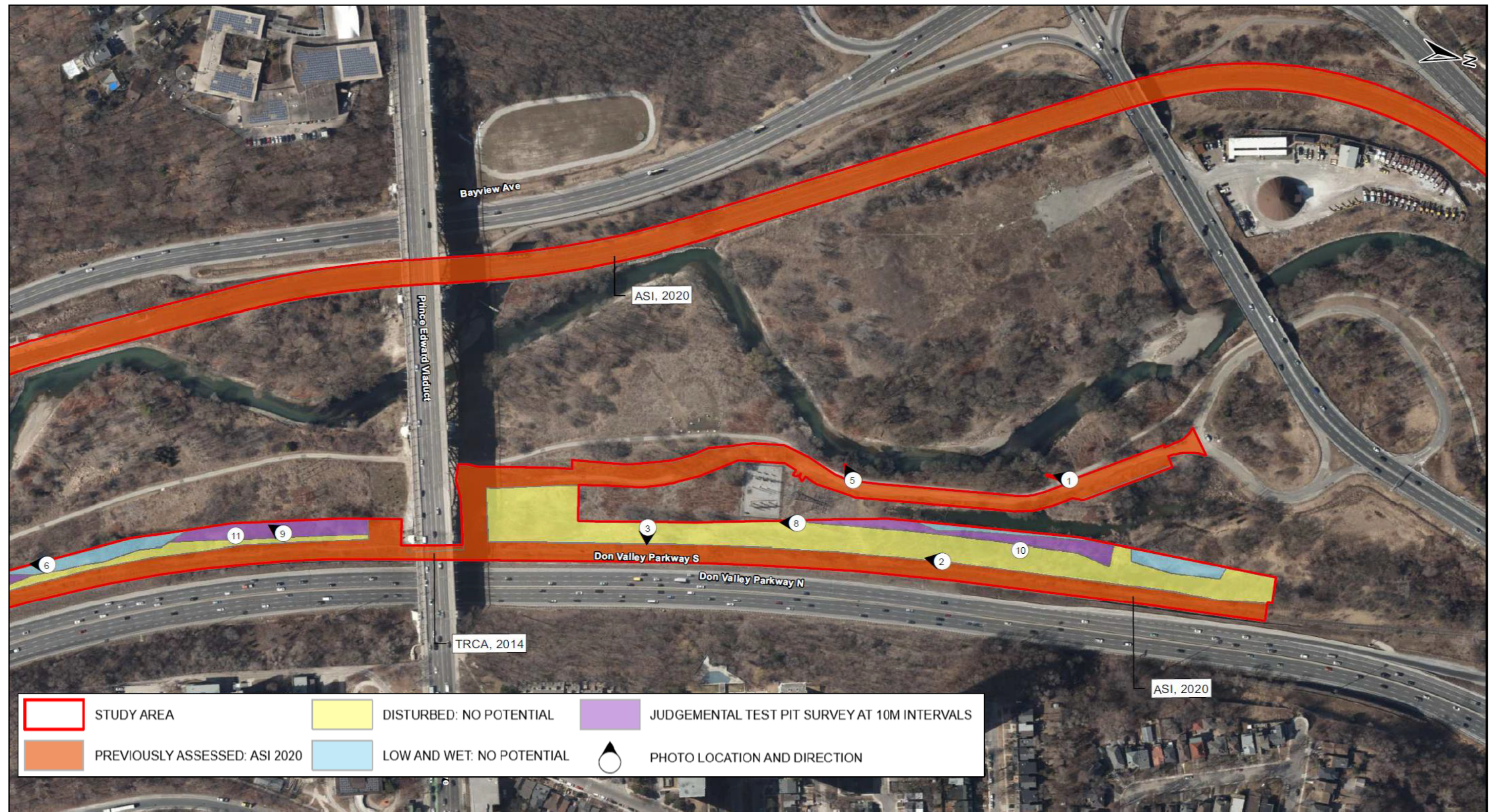


FIGURE 9-3 STAGE 2 ASSESSMENT RESULTS – DON VALLEY LAYOVER (CITY OF TORONTO)

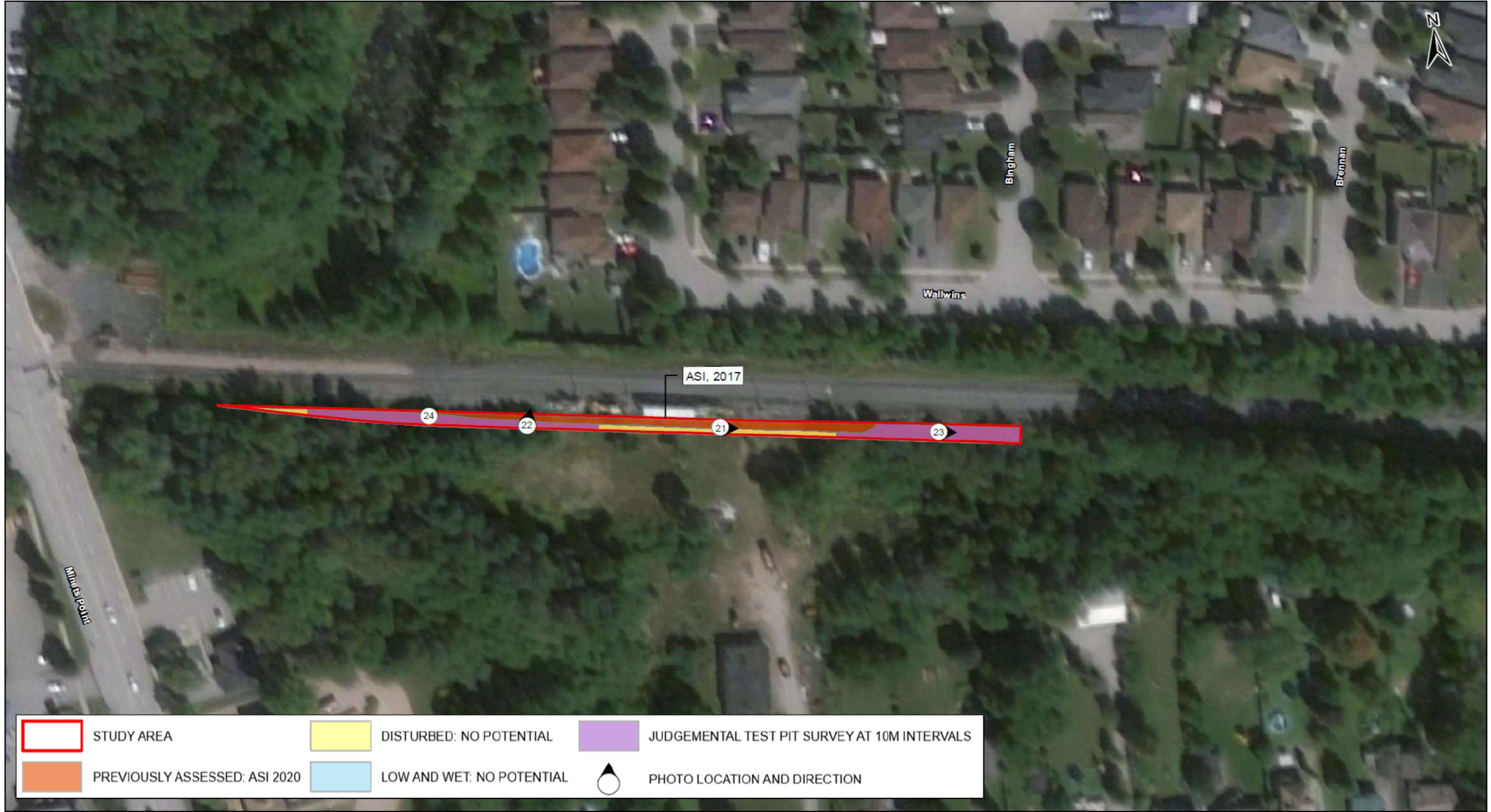


FIGURE 9-4 STAGE 2 ASSESSMENT RESULTS – TRACK SEGMENT BR-14 (CITY OF BARRIE)

9.12.6 Stage 3 & 4 Archaeological Assessment Studies

Based on the results and recommendations of the completed Stage 2 Archaeological Assessments, any required Stage 3 and/or 4 archaeological assessments will be carried out as required during detailed design and/or construction and associated recommendations for avoidance/mitigation complied with.

9.13 Noise & Vibration

9.13.1 Construction Noise Management Plan

Prior to commencement of construction, the Contractor will develop and submit a detailed Construction Noise Management Plan to Metrolinx. The Construction Noise Management Plan shall:

- Document and commit to all measures to be taken for meeting the noise exposure limits documented in the Metrolinx Guide for Noise and Vibration Assessment (2020) at every directly exposed sensitive receptor and throughout the entire project;
- Determine the Zone of Influence for construction related noise based on the noise exposure limits outlined in the Metrolinx Guide for Noise and Vibration Assessment (2020) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage;
- Identify all sensitive receptors that fall within the Zone of Influence for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply:
 - Additional mitigation is proposed and subsequently modelled until the sensitive receptor does not fall within the Zone of Influence; or
 - If mitigation strategies are not viable, receptor based mitigation will be proposed.

9.13.2 Construction Vibration Management Plan

Prior to commencement of construction, the Contractor will develop and submit a detailed Construction Vibration Management Plan to Metrolinx. The Construction Vibration Management Plan shall address and entail:

- Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration Zone Of Influence. The Zone Of Influence for vibration shall be established by using the methodology and input data provided in Section 7.2 of the US FTA Report No. 0123 (2018), Transit Noise and Vibration Impact Assessment Manual (2018);
- Complete pre-construction condition surveys for properties within the vibration Zone Of Influence of the planned work to establish their condition and establish a baseline prior to any work beginning;
- Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures;
- Identify buildings, where vibration sensitive activities such as sound recording or medical image processing take place, assess requirements and, if necessary, develop mitigation measures;

- Establish a 15-metre setback distance between the construction vibration source and nearby buildings, where possible, to minimize impacts. If this is not possible, then monitor the vibration levels associated with the activity;
- Select construction/maintenance methods and equipment with the least vibration impacts; and
- In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available.

In addition, the commitments, mitigation and monitoring measures as outlined in Table 9-9 will be completed with and implemented.

TABLE 9-9 MITIGATION MEASURES AND MONITORING COMMITMENTS – NOISE AND VIBRATION³

Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
Operational Noise (Trains)	<p>Environmental noise may cause annoyance, disturb sleep and other activities, and affect human health.</p> <p>If operations are projected to cause a 5-dB increase or greater in the average energy equivalent noise (referred to as “Leq”) relative to the existing noise level or the MECP objective of 55 dBA for daytime and 50 dBA for night-time, whichever is higher, then mitigation is required.</p>	<p><u>Mitigation per TPAP Study Report (Noise Barriers):</u></p> <ul style="list-style-type: none"> Deploy the noise barriers defined in the Noise and Vibration Study Reports GO Rail Network Electrification Project, 2020 (RWDI). Maintain noise barriers so as to ensure their continued effectiveness in noise reduction. If deviating from the assessments made in the <i>Noise and Vibration Study Reports GO Rail Network Electrification Project, 2020</i> (RWDI), comply with the noise impact and assessment criteria in the <i>Metrolinx Guide for Noise and Vibration Assessment</i> (2020). <p><u>Mitigation at the Source:</u></p> <ul style="list-style-type: none"> Deploy vehicle and track technology and related maintenance measures to maintain compliance with the noise and vibration exposure criteria defined below. <p><u>Mitigation Criteria:</u></p> <ul style="list-style-type: none"> Meet the following long-term day-time/ night-time maximum noise exposure objectives at all noise sensitive receptors across the system, where background noise levels allow their realization: <ul style="list-style-type: none"> 10-year objective: 70/60 dBA 20-year objective: 60/50 dBA 25-year objective: 55/50 dBA Meet the airborne noise exposure criteria in the 1995 MOEE/GO Transit Draft Noise and Vibration Protocol. Meet the ground-borne (vibration induced) noise exposure criteria in the 1995 MOEE/GO Transit Draft Noise and Vibration Protocol. Meet any additional future criteria or guidance developed by regulatory agencies, as applicable. 	<ul style="list-style-type: none"> Measure and document the Leq (16-hour) and Leq (8-hour) noise levels, under predictable worst-case conditions, at locations where new noise mitigation barriers have been provided per the 2020 noise and vibration studies and per the Metrolinx Enhanced Mitigation Program. Outdoor measurements will be carried out in accordance with MECP requirements and US FTA Report No. 0123, <i>Transit Noise and Vibration Impact Assessment Manual</i> (2018). The primary purpose of these measurements is to ascertain the effectiveness of the implemented mitigation measure(s). Assess the condition and performance of locomotives, coaches, DMUs and EMUs with respect to noise emissions as part of maintenance to ensure continued compliance with manufacturer specifications. Assess the condition and performance of the rail tracks and switches with respect to noise as part of maintenance to ensure continued compliance with manufacturer specifications.
Construction and Maintenance-Related Noise	<p>Environmental noise may cause annoyance, disturb sleep and other activities, and affect human health.</p> <p>The severity of the noise effects resulting from construction projects varies, depending on:</p> <ul style="list-style-type: none"> Scale, location and complexity of the project Construction methods, processes and equipment deployed Total duration of construction near sensitive noise receptors Construction activity periods (days, hours, time period) Number and proximity of noise-sensitive sites to construction area(s) 	<ul style="list-style-type: none"> Prior to commencement of construction, develop and submit a detailed Construction Noise Management Plan. The Construction Noise Management Plan shall: <ul style="list-style-type: none"> Document and commit to all measures to be taken for meeting the noise exposure limits documented in the <i>Metrolinx Guide for Noise and Vibration Assessment</i> (2020) at every directly exposed sensitive receptor and throughout the entire project. Determine the Zone of Influence for construction related noise based on the noise exposure limits outlined in the <i>Metrolinx Guide for Noise and Vibration Assessment</i> (2020) and taking into consideration the construction site, staging and laydown sites and hauling routes, each stage of the construction (including demolition), the overall construction schedule along with the schedule of each major component and associated major construction processes and equipment usage. Identify all sensitive receptors that fall within the Zone of Influence for construction related noise. Mitigation measures will be proposed for these sensitive receptors, and the effects of the proposed mitigation measures will then be evaluated using noise modelling. If results of the modelling indicate that any sensitive receptors still remain within the Zone of Influence for construction related noise, then the following shall apply: <ul style="list-style-type: none"> ✓ Additional mitigation is proposed and subsequently modelled until the sensitive receptor does not fall within the Zone of Influence; or ✓ If mitigation strategies are not viable, receptor based mitigation will be proposed. The Construction Noise Management Plan will include the temporary/permanent noise barriers indicated in the applicable noise and vibration construction impact assessment report (2020). Where additional work sites are identified which were not assessed as part of the applicable noise and vibration construction impact assessment report (2020), or where construction activities at any given site differ from those considered in this report, conduct modelling to evaluate the need for additional noise barriers as part of the Construction Noise Management Plan. 	<p>The Construction Noise Management Plan will incorporate the following requirements related to monitoring of noise and noise related complaints:</p> <ul style="list-style-type: none"> Monitor noise where the Construction Noise Management Plan indicates that noise exposure limits may be exceeded. At these locations, monitor noise continuously at each geographically distinct, active construction site with one monitor located strategically to capture the highest exposure level based on planned construction activities and the number, geographic distribution and proximity of noise sensitive receptors. Develop weekly reports describing the monitoring conducted and summarizing the data collected for the reporting period. The reports will include but not be limited to the number and duration of any incident during which any of the noise exposure limits documented in the <i>Metrolinx Guide for Noise and Vibration Assessment</i> (2020) were exceeded, the probable cause of each exceedance, the incident-specific measure(s) implemented, the resulting mitigated noise levels and the complaints investigation procedure. Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.

³ Regulations, standards and guidance documents referenced herein are current as of the time of writing and may be amended from time to time. If clarification is required regarding regulatory requirements, the Constructor is encouraged to consult with the appropriate regulatory agencies.

Environmental Component	Potential Effect	Mitigation Measure(s)	Monitoring
Operational Vibration (Trains)	<p>Vibration can cause annoyance, interfere with human activity and affect human health. It may also cause building damage.</p> <p>A change in vibration levels may occur where there are changes in track alignment, addition of new track, and changes to or addition of special track work.</p> <p>Vibration levels may also change with changes in rail vehicle specifications and operating conditions.</p>	<p><u>Mitigation per TPAP Study Report:</u></p> <ul style="list-style-type: none"> Deploy mitigation recommended in the OnCorr Noise and Vibration Study Report (RWDI). Review and update the vibration assessment during the design of new infrastructure at representative receptor locations to ensure compliance with the vibration exposure criteria in the MOEE/GO Transit Draft Protocol for Noise and Vibration Assessment (1994). <p><u>Mitigation at the Source:</u></p> <ul style="list-style-type: none"> Deploy vehicle and track technology and related maintenance measures to maintain compliance with the noise and vibration exposure criteria defined below. <p><u>Mitigation Criteria:</u></p> <ul style="list-style-type: none"> Meet the ground-borne vibration criteria in the 1995 MOEE/GO Transit Noise and Vibration Protocol. 	<ul style="list-style-type: none"> Measure and document the vibration impacts, under predictable worst-case conditions, of each distinct type of GO Transit train consist operating in the corridor of interest at locations where the 2020 noise and vibration studies recommends mitigation of vibration impacts. Measurements will be carried out at or near representative vibration sensitive receptors in accordance with MECP requirements and US FTA Report No. 0123, <i>Transit Noise and Vibration Impact Assessment Manual</i> (2018). The primary purpose of these measurements is to ascertain the effectiveness of the implemented mitigation measure(s). Assess the condition and performance of locomotives, coaches, DMUs and EMUs with respect to vibration levels as part of maintenance to ensure continued compliance with manufacturer specifications. Assess the condition and performance of the rail tracks and switches with respect to vibration levels as part of maintenance to ensure continued compliance with manufacturer specifications.
Construction and Maintenance-Related Vibration	<p>Exposure to vibration may result in public annoyance and complaints. Vibration may also cause damage to buildings and other structures.</p>	<ul style="list-style-type: none"> Adhere to the following vibration exposure limits: <ul style="list-style-type: none"> Vibration, as a human irritant, is assessed in terms of its average level. Vibration velocity should not exceed 0.14 mm/s or current conditions (whichever is higher) by more than 25%. As a threat to buildings, vibration is assessed in terms of its peak value. The Zone of Influence for vibration shall be the area where structures are expected to experience vibration peak particle velocities that exceed 5 mm/s. Vibration velocity should be limited to 8-22 mm/s, depending on vibration frequency. These limits are prescribed by the City of Toronto <i>By-Law No. 514-2008</i> for typical structures (not building with special needs). Adhere to the ground-borne (vibration induced) noise exposure criteria in the US FTA Report No. 0123, <i>Transit Noise and Vibration Impact Assessment Manual</i> (2018). Develop and implement a detailed Construction Vibration Management Plan for Metrolinx review and approval with minimum requirements outlined below: <ul style="list-style-type: none"> Complete a detailed construction related vibration assessment prior to the commencement of construction that includes assessment of the vibration Zone of Influence. The Zone Of Influence for vibration shall be established by using the methodology and input data provided in Section 7.2 of the US FTA Report No. 0123 (2018), <i>Transit Noise and Vibration Impact Assessment Manual</i> (2018). Complete pre-construction condition surveys for properties within the vibration Zone of Influence of the planned work to establish their condition and establish a baseline prior to any work beginning. Identify any heritage structures and other sensitive structures, buildings or infrastructure vulnerable to vibration damage, assess requirements and, if necessary, develop mitigation measures. Identify buildings, where vibration sensitive activities such as sound recording or medical image processing take place, assess requirements and, if necessary, develop mitigation measures. Establish a 15-metre setback distance between the construction vibration source and nearby buildings, where possible, to minimize impacts. If this is not possible, then monitor the vibration levels associated with the activity. Select construction/maintenance methods and equipment with the least vibration impacts. In the presence of persistent complaints and subject to the results of a field investigation, identify alternative vibration control measures, where reasonably available. 	<p>The Construction Vibration Management Plan will incorporate the following requirements related to monitoring of vibration and vibration related complaints:</p> <ul style="list-style-type: none"> Monitor vibration continuously at structures where the Construction Vibration Management Plan indicates that structures are deemed to be within the Zone Of Influence for construction related vibration or at additional structures as requested by Metrolinx. The type of Vibration Monitoring Program that is established is based on the vibration Zone Of Influence, the project location, duration, presence of night-time activity, and receptor proximity. The monitoring types include: <ul style="list-style-type: none"> ✓ Type 1: Monitoring continuously throughout the project (for receptors within the Zone Of Influence). ✓ Type 2: Monitoring during most impactful phases of the project only (for receptors outside of the Zone Of Influence but within 50 m of the boundary of the construction site). ✓ Type 3: Monitoring in response to complaints only (for receptors outside of the Zone Of Influence and beyond 50 m of the boundary of the construction site). Establish a Communications Protocol and a Complaints Protocol to respond to issues that develop during construction.

9.14 Air Quality

9.14.1 Construction Air Quality Management Plan

Refer to Chapter 7 of this EPR for construction related mitigation and monitoring measures that will be implemented and complied with, including the development of a detailed Construction Air Quality Management Plan (AQMP).

9.14.2 Operational Phase

In addition, the following mitigation and monitoring measures related to Air Quality during operations will be implemented and complied with.

Mitigation Measures

- A detailed Operations Air Quality Management Plan will be developed and implemented to limit the generation and dispersion of airborne particulate matter, NO_x and other air contaminants associated with the project operations;
- New traction engines or propulsion systems and new auxiliary engines and power units will meet higher emission standards (i.e., Tier 4 diesels rather than lower tier diesels);
- Engines and their emission control equipment will be maintained to manufacturers' specifications;
- Rebuilt diesel engines will meet Tier 4 emission standards at the time of major engine rebuilds;
- Unnecessary train / engine / propulsion system idling will be minimized through technical and operational measures; and
- Unnecessary non-revenue equipment runs will be minimized through design and planning.

Mitigation Criteria

- Diesel engines used for traction and auxiliary power in locomotives and DMUs are subject to corresponding US EPA and Transport Canada heavy-duty diesel engine exhaust emission standards for CO, PM, NO_x and HC.

Monitoring

- On-site inspections will be undertaken to confirm the implementation of the mitigation measures and identify corrective actions if required;
- Annually, test train propulsion and auxiliary power units, which produces exhaust emissions and ensure that they remain in compliance with applicable Transport Canada heavy-duty diesel engine exhaust emission standards for CO, PM, NO_x and HC. Engine testing will include:
 - Testing at no load;
 - Testing at 50% load; and
 - Testing at 100% load.
- Test rebuilt traction and auxiliary power diesel engines, before being placed into service, to the exhaust emission standards they are rebuilt to meet; and
- Develop an Air Sampling and Monitoring Plan and submit an annual report summarizing all sampling and monitoring results accumulated over the preceding year.

9.15 Traffic

Traffic Impact Assessment studies were undertaken as part of the TPAP based on the available conceptual designs to assess potential traffic impacts related to the construction and operation of the proposed Walkers Line Layover, Unionville Storage Yard, and Don Valley Layover facilities (refer to **Appendix I**). The following sub-sections discuss commitments specific to each proposed layover/storage facility; for further detail refer to Chapter 7 and **Appendix I**.

It should be noted that these Traffic Impact Assessment studies will need to be further reviewed and updated based on the detailed designs to be developed for each of the three layover/storage facilities; these studies should be undertaken in coordination/consultation with affected municipalities. Any additional or revised mitigation measures identified at detailed design to reduce potential traffic impacts / impacts on adjacent road networks and traffic patterns will be implemented as appropriate.

9.15.1.1 Walkers Line Layover Facility

A Traffic Impact Assessment was completed for the Walkers Line Layover Facility to determine the transportation impacts of the proposed facility (see **Appendix I**). The assessment recommended using only one access road, as to avoid potential conflicts with the existing bus dispatch center. This should be further considered by Metrolinx and key stakeholders during detailed design.

9.15.1.2 Unionville Storage Yard Facility

A Traffic Impact Assessment was completed for the Unionville Storage Yard Facility to determine the transportation impacts of the proposed facility (see **Appendix I**). This study, which was based on desktop analysis and information provided by Metrolinx and local municipalities, recommended further analysis of traffic conditions and compliance with the posted speed limit. Consideration of a restrictive median to prohibit left turns *out* of the facility (but allow left turns *in* to it) was also recommended for detailed design.

9.15.1.3 Don Valley Layover Facility

Access to the Don Valley layover is proposed from the Don Valley Parkway Connector (linking the main Don Valley Parkway to Danforth Avenue and Bayview Avenue). The Traffic Impact Assessment for this facility (see **Appendix I**) recommended redesigning the access points to include deceleration and acceleration lanes to improve safety. This should be further considered by Metrolinx and key stakeholders such as the City of Toronto during detailed design.

9.16 Utilities

9.16.1 General

It will be necessary to finalize the site servicing plans beyond their current conceptual level of detail prior to construction to improve the completeness and accuracy of utility information; specifically, the extent of actual utility conflict(s). This is because the records for underground assets that were reviewed in developing the conceptual designs were classified as Quality Level 'D' information, meaning the cover depths for third-party utility assets were not confirmed. Until depth/clearance from the ground elevation to the utility is confirmed, the ultimate extent of conflicts cannot be determined.

Furthermore, the utilities assessment completed at the conceptual design/TPAP stage did not include a review of railway assets, which are utilities owned by Metrolinx or other railway owner, operators, or maintenance companies. Railway assets include signal cables, signal power cables, snow clearing devices, switch machines, and any other infrastructure owned by a Rail Operator (such as Metrolinx, Canadian National (CN), Bell/360, Canadian Pacific (CP), etc.). Metrolinx's Contractor will be required to identify and mitigate conflicts as required to accommodate their design.

Potential effects/conflicts with known utilities were assessed, and mitigation measures identified as appropriate as part of the TPAP. There are a significant number of utilities and utility owners in the study area. As part of the TPAP, these utilities were contacted regarding the potential effects due to the proposed infrastructure, however the final assessment of utility conflicts due to the proposed infrastructure will need to be evaluated at the detailed design phase. Implementation and construction obligations will be undertaken pursuant to the crossing agreements with each of the utility companies as required.

9.16.2 Further Studies – Utilities

During the detailed design phase, the exact locations and depths of utilities will be determined and the staging and relocations approach will be established in discussion with affected utility companies. The following additional work will be undertaken as appropriate:

- Continue to meet with the utility companies to determine risks, timing and the appropriate mitigation strategy to address potential conflicts;
- Confirm utility relocations/protection required based on detailed design and undertake negotiations with relevant utility companies, as required;
- Based on the requirements of each utility company, utilities will be relocated or protected to allow for the electrification construction works and allow trains to pass without damage;
- Utilities affected by construction will be temporarily relocated along the roadway and railway right-of-way;
- With input from legal counsel for both contracting parties, amend existing crossing agreements or develop new crossing agreements that set out the additional cost burdens associated with deenergizing and limited operational windows as well as fines related to cable fall;
- Develop a mitigation plan with each utility that includes the appropriate contractual options to implement the appropriate mitigation strategy (see **Appendix J**);
- Implement the mitigation plan through the applicable contractual parties from design through to construction;
- Monitor construction activities to ensure that works schedule is being coordinated;
- Spatial and electrical clearance conflicts may be mitigated through removal, relocation, reconfiguration or burial of overhead utilities;
- For utilities attached to bridges, further study of the potential conflict during the design phase will be required to determine the extent of actual conflict; and
- Electrical zone of influence effects may be mitigated through grounding and bonding or isolation.

9.16.3 Utility Relocations

The following outlines the various options for undertaking Utility relocations during the subsequent design/construction phases.

- Option 1 – Utility Early Work Contract
 - Utility design and construction are done prior to Metrolinx commencing work.
- Option 2 – Request for Proposal (RFP) Agreement
 - Utility design is done by the Utility company, and Metrolinx constructs with Utility supervision.
- Option 3 – Alternate Financing and Procurement (AFP) on board agreement

- Metrolinx does the design and construction (Utility company provides approvals and/or supervision).

Work undertaken as Option 1 will have limited construction impacts as the utilities will be relocated prior to the construction period. However, some pre-relocated utilities may have to be protected during construction of new tracks. Work undertaken as Option 2 and Option 3 may have construction impacts, in that they may occur at the same time as construction.

The determination of which option is to be employed was still to be determined at the time of writing this EPR.

9.16.4 Hydro One Infrastructure

If there are Hydro One towers identified for relocation during detailed design, the appropriate *Environmental Assessment Act* process requirements will be fulfilled as applicable (e.g., TPAP Addendum, Class EA, etc.)

9.17 EMI/EMF

An Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI) Assessment was carried out as part of the NTF TPAP to document existing EMI conditions along the Richmond Hill corridor study area and to determine the potential effects of implementing an electrified corridor. The results of this assessment recommended that additional studies and analyses will need to be carried out during the future phases of the project, and once the electric train specifications are known. All recommendations for mitigation and future study as identified in the EMI/EMF Impact Assessment Report (see **Appendix N** for further detail) will be implemented.

The following section outlines the commitments Metrolinx will adhere to during future phases of the project following TPAP completion.

9.17.1 General

In terms of the prevention and mitigation of electromagnetic fields and radiation on the Project, several general strategies will be used. These strategies address the need to continue to monitor and mitigate appropriately. They apply equally across the entire corridor, and across all rolling stock. They include:

- Generation of an EMC Control Plan, to communicate the design and development strategy for EMC generally—including both ELF and EMI—and catalogue the types of electronics that will be installed;
- Verification of EMI and EMF levels generated by the rolling stock, both in passenger compartments and at trackside, including at typical station locations, using industry-standard techniques; and
- Data review of the industry-mandated EMC reports for components used throughout the implementation and the measurements and studies conducted post-construction, to generate a final EMC Report for the project.

9.17.2 Electromagnetic Compatibility Control Plan

Metrolinx will prepare and implement Electromagnetic Compatibility (EMC) Control Plan, to communicate the design and development strategy for EMC (including both ELF and EMI) and to catalogue the types of electronics that will be installed.

For both Extremely Low Frequency (ELF) Electromagnetic Fields (EMF) and Electromagnetic Interference (EMI), industry-standard mitigation measures will be applied as well in applicable standards and references documented in the Appendix of the EMI/EMF Impact Assessment Report (see **Appendix N**). During detailed design, further analysis and measurements will be carried once the

electric rolling stock specifications are known in order to ensure EMI immunity and emissions compliance for the electrified corridor.

As per the American Public Transportation Association (APTA) Standard SS-E-010-98, the EMC Control Plan should include but not be limited to:

- Characterizing potential EMI sources and hazards to transit/rail operations;
- Consideration of low-cost, no-cost options, or best practices for EMI prevention, control and mitigation techniques. Examples include posting warning signs to control access, fencing, and shielding of substations, or grade crossing access, as needed;
- Consideration of best practices in EMI susceptibility control procedures. Examples include active or passive shielding, cathodic protection, surge protection, fail-safe circuit redesign, changed location of antennas or susceptible equipment, redesign of equipment, enclosures for equipment, etc.;
- Utilization of current EMC guidance and resources for transit electrification developed by EPRI, AAR and AREMA as discussed in Sec. V B EMF Modelling and Measurement Tools;
- A safety analysis and failure analysis of the transit system;
- Addressing grounding or shorting hazards, prevents, controls or mitigates as needed for stray currents (earth-return currents or induced currents in metallic structures and pipelines or along the return rails where some fraction of the current finds its way back to substation or generating station through the earth for various regions and soil conditions), and the effects of different design and construction practices on these currents;
- Characterizes the frequency bands, spectral characteristics of ELF/EMF and RF generated noise by the pantograph-catenary contact under operating conditions; and
- Characterizes along the right-of-way parameters (e.g., frequency spectrum, electric and magnetic field strengths, modulation system) for the wireless communications, control, and power and propulsion system (including auxiliary power for HVAC, emergency lighting and signage, public address, etc.).

The EMC Control Plan will include provisions for: immunization of freight track circuits and grade crossings as well as immunization of compatible track circuits, impedance bonds as well as bonding and grounding for currents.

9.17.3 Frequency Management Plan

A Frequency Management Plan will be developed and implemented by Metrolinx during the detailed design phase. This plan is needed to capture the operating frequencies at the system engineering level from all intentional radiators in the vicinity of the railway.

9.17.4 Construction Phase

Ensure compliance with requirements as outlined in *EN 50121*, *IEEE C63.12*, *AREMA Signalling and Control Manual 11.5.2*, *IEC 61000* and other relevant EMC standards by product manufacturers. The manufacturers will be required to provide compliance test results and supporting documentation to Metrolinx during the project construction phase.

9.17.5 Commissioning Phase

During the electrification commissioning phase, overall ELF and RF emissions emanating from the electrified railway corridor (including emissions from all the electrified tracks, OCS, and EMU trains) will be field tested and verified to ensure EMFs are within the limits of applicable industry standards.

9.17.6 Operations/Maintenance Phase

Undertake testing and maintenance procedures in order to mitigate EMI to track circuits and increase personnel safety due to EMI induced common mode voltage.

9.17.7 EMF Exposure Reduction

As per FTA Best Practices for EMF concerns, particularly ELF EMF, the only relevant⁴ Best Practice is:

Conduct baseline measurements before and after transit system construction and operation.

EMF and EMR measurement surveys along the right-of-way and of locations where... OCS would be placed are recommended. If measurements are too costly, EMF and EMR data on similar transit systems and urban environments can be used, in combination with M&S tools, to predict environmental EMF levels as a function of distance from the right-of-way. The objective is to compare the pre-existing "before" background EMF levels, with expected "after" construction EMF. This allows the determination of incremental EMF contributions from the planned electric transit system.

Data will also permit identification of potential EMF or RF "hotspots" in publicly accessible areas (stations, streets, near utility substations, in vehicle) that might require mitigation.

As previously noted, baseline measurements are to be re-assessed post-electrification and cataloged.

9.18 Public/Stakeholder Engagement

Metrolinx will continue to engage and communicate with stakeholders beyond TPAP completion as follows:

- Engage with affected property owners within Study Area to acquire property easements, as/if required;
- Engage with affected property owners with respect to grounding and bonding locations, as required;
- Engage with affected communities along the rail corridors with respect to next steps for determining areas where noise/vibration mitigation measures are recommended and the form/type of mitigation to be implemented;
- Design and implement a response strategy to address/resolve potential noise/vibration complaints during the construction phase, as required;
- Carry out future discussions and negotiations with municipalities in relation to alterations/modifications required on municipal-owned or jointly-owned bridges/rail overpasses along the Richmond Hill Corridor to accommodate electrification;
- Review options with Municipalities as required to maximize the aesthetics of project infrastructure, such as layover and storage facilities where/if possible;
- Coordinate with Municipalities to develop traffic, parking, transit, cycling and pedestrian management strategies to be included in construction contract documents, as appropriate, to avoid/minimize interference to the extent possible;

⁴ Additional EMF Reduction Best Practices are listed in FTA Guidance on the Prevention and Mitigation of Environmental, Health and Safety Impacts; however, direct baseline measurements of conditions along the planned GO Rail Network Corridor combined with the results of North American studies of electrified train properties, suggest that no other steps for EMF Protection, Reduction, and Mitigation are necessary.

- Coordinate with Municipalities to review detailed designs affecting heritage resources/properties of interest and incorporate feedback/input into final designs, as appropriate; and
- Confirm locations of any additional contractor staging/storage areas required which may require leasing agreements with private property owners and/or affected Municipalities.

9.19 EPR Addendum Process

In recognition of the fact that there could be changes to the project design/description following its TPAP completion during detail design and/or construction, Metrolinx will comply with *O. Reg. 231/08* for reviewing any changes to the project following completion of the TPAP. Such changes may result from:

- Unforeseen site-specific problems encountered only during detail design and/or construction;
- Improvements in the design to provide greater environmental benefits and/or less adverse effects;
- Elements of the project that were not previously envisioned;
- Circumstances that develop at the time of construction;
- Issues identified in other approvals processes; and/or changes to the regulatory framework (i.e., new legislation or regulations).

Metrolinx will therefore review any changes to the project design/description and determine whether the change constitutes either: (1) an Insignificant Change (see Section 9.19.1), or (2) Significant Changes (see Section 9.19.2).

The following questions may be applied to the proposed change as part of the review to determine how it should be dealt with:

- Is there a change to what was proposed to be built?
- Is there a change to where something was to be built?

Metrolinx will utilize the responses to these questions to determine how the proposed change will be dealt with. For example, in the case where a “Yes” is provided, then Metrolinx will determine the significance of that change in terms of its potential effect on the environment, a stakeholder (including the public), and/or a commitment made in the New Track & Facilities EPR.

9.19.1 Insignificant Change

If the significance of the change is determined to be not significant/negligible, in accordance with *O. Reg. 231/08*, Metrolinx will document the rationale for this decision and keep a record of the EPR addendum/change documentation in the project file. The EPR Addendum documentation to be kept on file will contain the following:

- A description of the change;
- Reasons for the change;
- Assessment/evaluation of potential impacts that the change may have on the environment;
- Description of any proposed mitigation measures for mitigating potential negative impacts on the environment due to the change; and
- A statement of whether the changes were deemed significant or not and the reasons for this opinion.

Following this, Metrolinx would go ahead and implement the change. A Notice of Environmental Project Report Addendum will not be required/published.

9.19.2 Significant Change

If the significance of the change to the project is deemed to result in an increased potential adverse effect, then it would be categorized as a change that will require publishing of a Notice of EPR Addendum, as per *O. Reg. 231/08*.

An EPR Addendum will be prepared containing the following information:

- A description of the change;
- Reasons for the change;
- Assessment/evaluation of potential impacts that the change may have on the environment;
- Description of any proposed mitigation measures for mitigating potential negative impacts on the environment due to the change; and
- A statement of whether the changes were deemed significant or not and the reasons for this opinion.

In addition, in accordance with *O. Reg. 231/08*, A Notice of Environmental Project Report Addendum will be published and provided to the Director (MECP), Regional Director (MECP), landowners within 30 metres of the site/location of the change, Indigenous communities on the Project Mailing List and any other person who may be interested in the change.