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City of Kingston Third Crossing of the Cataraqui River -  
Parks Canada Environmental Impact Analysis  
Detailed Impact Analysis Report - Section 4

Project Report

December 2, 2019

**City of Kingston Third Crossing of the Cataraqui River  
Parks Canada Environmental Impact Analysis**

**Detailed Impact Analysis Report - Section 4**

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## **4. Mitigation Measures**

### **4.1 Definitions**

Approval – means approval that is provided in writing by the relevant Federal or Provincial Authority. The proponent is responsible for requesting approvals in advance of related work. The number of business days in advance must be agreed to by the relevant Authority.

Environmental Management Plan (EMP) – documents that provide details relating to Project requirements and mitigation measures. All EMPs must be developed in a manner that is site specific.

Federal Authorities – designated representative of Parks Canada Agency (PCA), Fisheries and Oceans Canada (DFO), or Transport Canada (TC)

Project Location – area where the construction is taking place, including both in-water and upland areas. In general, the Federal Authorities have jurisdiction over in-water work and other relevant authorities have jurisdiction over upland areas. Work activities carried out in upland areas have the potential to impact in-water areas. Mitigation measures have been included to mitigate impacts originating from upland areas. It is the responsibility of the Proponent to ensure that they are getting approvals from the authority having jurisdiction.

Proponent – City of Kingston

Provincial Authorities – designated representatives of provincial departments that have issues permits (i.e. Conservation Authorities, Ministry of Natural Resources and Forestry (MNRF), and Ministry of Environment, Conservation and Parks (MECP))

### **4.2 General**

1. Inform the Federal and Provincial Authorities regarding any changes to Project plans and/or scheduling. Any changes not assessed under this DIA will require approval from relevant authorities and may require further mitigation measures or amended permits.
2. The Proponent is required to submit an Environmental Management Plan (EMP) to PCA and other relevant Federal Authorities that outlines all the measures to be implemented by the Proponent on the Project Location to eliminate or reduce environmental effects and address mitigation measures outlined in this DIA. In order to allow for the timely commencement of Project activities, the EMP can be submitted as separate components as Project details become available. The

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EMP, or its components, will be submitted in writing prior to implementation of Project activities and must be accepted by PCA and the Federal Authorities.

3. It is required that an environmental professional(s) prepare the EMP or its component plans incorporating guidance found in PCA's Environmental Standards and Guidelines (ESG) - Ontario Waterways (2017). The EMP will detail frequency of monitoring and list high-risk construction activities where an environmental professional must be onsite. Monitoring and testing must be adaptable to changing site conditions and will capture any event/incident for the length and scope of that event.
4. Where there is a conflict between the ESG, the DIA, the drawing and design specifications, or any other relevant documents, the most stringent mitigation measure will apply.
5. If there is a conflict between permits for work activities outside of the jurisdiction of the Federal Authorities and the ESG, the DIA, the drawing and design specifications, or any other relevant documents the proponent shall coordinate a meeting between the relevant authorities to resolve the conflict.
6. A Historic Canal Regulations permit, a Fisheries Act authorization, and a Canadian Navigable Waters Act approval applicable to lands and water administered by the Government of Canada and signed by the delegated federal authorities will be required to authorize the Project work prior to commencement of the Project.
7. The Proponent is to ensure that all on-site personnel are aware of and comply with the prescribed mitigation measures within this DIA and EMP and terms and conditions of the Historic Canal Regulations permit, a Fisheries Act authorization, and a Canadian Navigable Waters Act approval. People working on the Project/activities must review and sign-off on the mitigation measures and any site-specific considerations with designated Federal Authorities before work begins.
8. Clearly mark the work site and restricted areas with stakes, biodegradable flagging tape or appropriately installed protective fencing or other suitable barriers to minimize the disturbance footprint, particularly within the Greater Cataraqui PSW; remove when the Project is completed.
9. Staging areas, material/equipment drop sites, and parking areas must be identified, including duration of use, within an existing disturbed footprint (e.g.,

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roadway, gravel surface, previously disturbed area with high resiliency) or as approved by relevant Authorities.

10. Use existing roadways, trails, disturbed areas or other areas as approved by designated Federal and Provincial Authorities for site access, travel within the site and construction activities.
11. Should conditions at the work site indicate that there are unforeseen negative impacts to the valued components, all works shall cease until the problem has been corrected and/or any required input can be obtained by PCA or other relevant authorities. The Federal Authorities have the right to require that work be altered or ceased immediately.
12. Key contacts and their respective roles and responsibilities must be identified prior to work starting and communicated to all on-site workers.
13. PCA shall be notified a minimum of 48 hours prior to the commencement of any high-risk activities identified in the EMP.
14. With the exception of the approved causeway design and placement of material for the purpose of fish habitat enhancement during Project restoration works, the placement of loose aggregate into a waterbody shall not be permitted.
15. The Proponent will minimize the extent and footprint of the works as much as practical and reinstate the area as per existing conditions or improve on existing conditions where feasible.
16. The Proponent will ensure the flow management system, which directs water flow around the work area, does not erode or destabilize the bed or banks of the watercourse, or contribute to sediment loading of aquatic habitat.
17. The Proponent must engage an appropriately-qualified and independent Environmental Monitor to inspect the work site, collect water quality measurements and samples, and notify the Proponent where modifications to the work may be necessary to meet the environmental protection objectives for the Project including a temporary stop work order in order to comply with EMP. The Proponent must inform FAs of recommendations provided.

### **4.3 Heavy Equipment and Machinery**

18. Use and Maintenance of Heavy Equipment shall be conducted according to PCA's ESG Document ESG-15-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

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19. Heavy machinery shall operate from above the top of the streambank, on-shore above the normal water level, or above the waterbody on a constructed structure. Heavy equipment shall not enter water.
20. Only the working part of a machine is to enter the water; any part of a machine or equipment entering the water shall be free of fluid leaks and externally degreased to prevent any deleterious substance from entering the water. Complete the in-water activity as quickly as possible to minimize the time equipment is in the water; do not leave equipment in water during breaks in work activity.
21. Heavy machinery shall not be parked overnight or for long periods of shutdown in causeway or trestle areas. Where site conditions do not allow for removal of equipment, other measures to address leaks and spills must be identified in the EMP and implemented (e.g., ground protection mats or rig mats).
22. Equipment shall be inspected regularly to ensure that it is clean, free of leaks, and in optimal working condition.
23. Any working part of a machine that is to enter the water using hydraulic fluids shall use biodegradable fluids, such as Panolin HLP Synth, following industry standards for in-water works. Biodegradable fluids are also recommended by equipment manufacturers to maintain equipment in proper working condition. Experience has shown that vegetative-based fluids can produce issues with equipment breakdown, freezing parts in cold weather, and poor performance.
24. Select equipment appropriate to the nature of work being conducted (e.g., avoid using large scale machinery when hand tools or smaller scale machinery could be used).
25. Heavy equipment operating on paved surfaces must be equipped with street pads; damage to paved surfaces must be restored to original conditions.

#### **4.4 Pile Driving**

26. The PCA Environmental Authority shall be contacted and advised at least 48 hours in advance of the start-up of the proposed pile driving operations.
27. Pile driving shall be conducted from the shore or from an existing structure (e.g., berm, dam, causeway) where possible.

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#### **4.5 Borehole and Rock Drilling**

28. If necessary, borehole and rock drilling shall conform to PCA's Best Management Practice for Geotechnical Investigations (Borehole Drilling). Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

#### **4.6 Grinding and Welding**

29. Grinding and Welding shall be conducted according to PCA's ESG Document ESG-9-C. Deviations from specific requirements related to grinding and welding will be provided in the EMP and approved by relevant authorities.

30. All grinding and welding activities must be conducted in a manner as to prevent release of weld rods, metal chips, or any other debris into adjacent surface water. When possible, undertake grinding, welding, and similar activities indoors or off site and comply with health and safety, technical, and waste management specifications.

#### **4.7 Concrete Pour Operations and Grouting**

31. Concrete Pour Operations and Grouting shall be conducted in accordance with PCA's ESG Document ESG-5-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

32. All concrete, sealants, or other compounds used for this Project shall be utilized according to the appropriate Product Technical Data Sheet, stating guidelines and methods for proper use, and provided by the manufacturer of the product.

33. Unless specified and approved in contract documents, ensure that all works involving the use of concrete, cement, mortars, grout and other Portland cement or lime-containing construction materials are not deposited, directly or indirectly into any watercourse. Concrete materials cast-in-place must remain inside the formed structure.

34. Containment facilities shall be provided for the wash-down of concrete equipment including concrete delivery trucks, concrete pumping equipment and hand tools. Wash-down shall occur away from water.

35. All concrete wash water will be captured and disposed of off-site in a location where it will not enter subsurface drains, waterbodies or storm drains.

36. Water that contacts uncured or partly cured concrete shall be prevented from entering any watercourse or stormwater system.

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37. Use only non-toxic biodegradable form stripping agents.
38. Concrete leachate is alkaline and highly toxic to fish and aquatic life. Measures must be taken to prevent any incidence of concrete or concrete leachate from entering the watercourse. Maintain complete isolation of all cast-in-place concrete and grouting from fish-bearing waters for a minimum of 48 hours if ambient air temperature is above 0°C and for a minimum of 72 hours if ambient air temperature is below 0°C or until significantly cured to allow the pH to reach neutral levels. Isolation or mitigation techniques will not be removed until pH returns to background levels.
39. Ensure that all works involving the use of concrete will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into or about any watercourse.
40. Any work site involving chipping and cutting of concrete shall be isolated from the environment. The isolated work site must be sufficiently large to contain water run-off, residues and any waste material.
41. Concrete debris shall be placed into an enclosed container daily, or more frequently if required, in order to ensure that no debris escape or remain at the Project Location.
42. Environmental Permits shall be obtained by the Proponent for any off-site disposal.
43. Filter fabric material shall be designed around the principals of maintaining sufficient hydraulic flow and prevention of particle movement through the material.
44. Sufficiently sized carbon dioxide tanks with regulators, hoses and gas diffuser, shall be readily available during concrete pour operations to neutralize pH levels.

Tremie Pour Operations:

45. Tremie pour operations may be undertaken where site conditions do not allow work in the dry and in still water or near zero flow conditions exist (i.e., < 0.5 m/s). Justification of the need for the Tremie pour operations must be included in the SSEMP.
46. The work area for a Tremie pour shall be isolated with a turbidity curtain (See PCA's ESG Document Sediment Control ESG-2-Pre; SLR 2017) and/or impermeable material (e.g. steel casings, sheet piling, sandbags plus



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impermeable material to line sandbags) and isolated area must be the minimum size required to complete task. De-fishing the area as required

47. The use of neutralizing acids to neutralize waters with high pH is prohibited at Tremie pour operations.
48. For tremie pours or where water comes into contact with the forms or there is the potential for an in-water release, a carbon dioxide system must be installed and operating along the entire length of the isolated area; the tank shall be used to release carbon dioxide gas into an affected area to neutralize pH levels. Ensure tank size is sufficient for the volume of water to be treated.
49. pH monitoring shall be conducted inside and outside the containment area and CCME Canadian Water Quality Guidelines for the Protection of Aquatic life must be met on the outside of the isolated area.

#### **4.8 Noise**

50. Conduct all work activities in accordance with the Project's Environmental Management Plan, PCA's relevant ESG Sections and the City of Kingston's Noise Control By-Law (No. 2004-52). Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
51. Make use of engineering controls to modify equipment / machinery or the work area to reduce noise disturbance (e.g., substitute existing equipment with quieter equipment; retro-fit existing equipment with damping materials, mufflers, or enclosures; erect barriers; maintain equipment; etc.).
52. Avoid excess and unnecessary noise.
53. Adhere to local noise by-laws; Residents will be notified of planned activities that may cause disturbance. These will be scheduled to avoid sensitive time periods wherever possible (see Schedule B of the City of Kingston Noise Bylaw).
54. Public complaints will be monitored by keeping a record and issues raised will be addressed in a timely manner.
55. Construction (permanent) noise barriers will be installed in the locations presented in Appendix B.
56. Vegetative buffers on the east side to mitigate dust and noise, must be maintained between residences and the work site.

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- 57. Proper construction equipment engine warm-up, checks, and ramping up of vibration or impact components, will be employed to enable wildlife to vacate the work area prior to meeting injury or impairment noise thresholds.
- 58. Concurrent underwater noise generating activities will be minimized to the extent possible or sequenced to minimize their duration by limiting the number of impact strikes, using vibro-hammers and gravity to the extent possible and adjusting configurations to reduce the number of piles where possible.

#### **4.8.1 Noise Mitigation for Birds**

- 59. The installation of steel casings, trestle piles and falsework will be undertaken with vibratory and impact hammers with the use of impact hammers limited to between one and 14 minutes per pile to reduce the potential for adverse effects to birds.
- 60. The generation of low-level noise in the construction area prior to commencing pile driving in order to scare birds away will be implemented (i.e. ramp-up procedure).
- 61. Construction noise monitoring will be completed prior to the breeding bird window of 2020 to determine actual noise levels at sensitive receptors including the marsh to the north and Belle Island to the south. If required, additional mitigation measures will be employed to ensure noise levels will not exceed 55 dBA in sensitive locations.

#### **4.8.2 Noise Mitigation for Fish**

- 62. Potential acoustic impacts on fish due to impact pile-driving noise was modelled by the IPD team using established acoustic impact threshold criteria available in scientific literature (see Appendix G for thresholds). To mitigate against potential adverse acoustic impacts, the preferred method for installing piles was altered to an installation method using a vibratory pile driver on the caisson with a combination of vibratory and impact for temporary piles, minimizing impact pile driving to one (1) to 14 minutes per pile.
- 63. During pile installation, low-level noise will be generated in the construction area prior to commencing pile installation to encourage fish to vacate the area (i.e. ramp-up procedure). This will be accomplished by striking steel members of the pile template, (a 43m long steel template used to hold the template in place while piling) before each pile is placed into position. During drilled shaft casing pile installation, the adjacent trestle pile will be used to create noise.

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Construction noise monitoring (Section 8) will be completed to record actual noise levels, given current noise modelling does not take into consideration the attenuation of noise by existing plants or the Aquatics Exclusionary Turbidity Curtain (AETC).

#### **4.9 Dust and Air Quality**

64. Conduct all work activities in accordance with the Project's Environmental Management Plan. Fugitive Dust Control during Construction shall be conducted according to ESG Document ESG-8-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
65. Inspection, washing, and cleaning of all vehicles, boats and equipment will be performed in accordance with the procedures, checklists and diagrams provided in PCA's ESG Document ESG-16-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
66. Wash / clean vehicles, machinery, and equipment to reduce fugitive dust emissions.
67. Erect shrouds around working areas to prevent dust and other airborne debris from entering the air or river.
68. Fugitive dust levels measured as total suspended particulate at the property boundary shall not exceed the Ontario Ambient Air Quality Criteria of 120 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) over 24 hours or  $60 \mu\text{g}/\text{m}^3$  averaged over a year. For measuring methods, refer to the Canada-wide Standards for Particulate Matter and Ozone Ambient Air Monitoring Protocol.
69. All heavy equipment must comply with the latest equipment specifications in the Off-Road Compression-Ignition Engine Emission Regulations (SOR/2005-32) that contain emission standards for diesel engines used in off-road applications such as those typically found in construction. The Regulations, under Section 160 of CEPA, are applied to engines of the 2006 and later model year.
70. Dust suppression techniques (such as wetting down granular materials use for access roads to prevent the wind from blowing dust and debris and sweeping at site entrances) will be employed as conditions require. Granular material (screened fill material with reduced fines) will be utilized for access roads, reducing the need for mud mat use at construction exits and greatly reducing dust suppression needs. This also provides for the benefit of reducing the need for equipment use (for dust suppression) on site. The site currently has

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established granular fill access roads, enabling clean access for access roads. Construction vehicles on site will only drive on screened fill to minimize the generation of dust.

71. All on-site vehicles will be expected to have a Drive Clean Emissions Report in compliance with O.Reg.361/98: Motor Vehicles under the Environmental Protection Act, R.S.O.1990, C/ E19; Officers may stop a vehicle if they believe the vehicle is emitting excessive exhaust smoke or suspect that emission control equipment has been tampered with or removed.
72. All vehicles will be licensed by the MTO, which administers emissions control regulations.
73. Well-maintained heavy equipment and machinery will be used, preferably fitted with fully functional emission control systems/muffler/exhaust baffles, engine covers, etc.
74. Machines shall not be left to unnecessarily idle in order to avoid unnecessary emissions.
75. All stockpiled materials shall be stabilized to prevent erosion or fugitive dust. Stabilization includes geotextile, mulch, soil and hydroseeding, or alternative methods as approved by relevant authorities.
76. The use of water as a dust suppressant is preferred to the use of chemical agents. The use of chemical agents must be approved by relevant authorities prior to use.
77. All construction site exits to public roads, where Granular B material is not in place shall be stabilized using temporary tracking pads or mud mats. The location(s) and type(s) of vehicle tracking controls and mud mats shall be identified in the EMP. The pad or mud mats will be designed for the full width of the entrance or a minimum width of 3.6 m wide and the minimum pad/mat length of 5 m.
78. Any loose material and other debris not captured by dust suppression techniques and released by heavy equipment will be removed daily from public roads.

#### 4.10 Lighting

79. The following mitigation measures to reduce the potential for effects to adjacent natural areas (including fish and fish habitat, birds and bird habitat) are based on PCA's *Guidelines and Specifications for Outdoor Lighting at Parks Canada, Dark*

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*Skies, Ecosystem Protection and Energy Savings* (2016). Additional mitigation measures, if required will be included in the EMP for the Project.

- Construction lighting will be shrouded and directed downwards within the construction site to minimize the amount of lighting escaping into the adjacent natural areas, and to prevent lighting from shining directly into the water.
- Lighting will be task-specific and utilize the lowest illumination possible, while meeting safety requirements.
- Lighting would be manually turned-on and off, engaged only during active construction.

80. Mast lighting will be used on the causeway; these lights can be individually adjusted prior to raising to ensure the lights are pointed correctly. Additionally, the mast can be raised to variable elevation for optimal lighting control.

#### **4.11 Erosion and Sediment Control**

81. Adhere to the guidelines for Erosion Control and Sediment Control in PCA's ESG Document ESG-1-Pre and ESG-2-Pre, respectively. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

82. Sediment and erosion control measures must be in place and shall be upgraded and maintained, such that release of sediment is avoided at the location of the authorized work, undertaking, or activity.

83. Effective erosion and sediment control measures shall be in place prior to, during, and after construction activities and until revegetation or other mitigation measures are sufficient to control erosion.

84. Erosion and sediment control measures and structures shall be inspected and maintained on a daily basis during the course of construction by an experienced/qualified erosion and sediment control onsite inspector to ensure they are functioning properly and are maintained and/or upgraded as required to prevent entry of sediment into the water.

85. Pre-construction clearing, vegetation removal, and/or grading for access roads, laydown areas, and temporary storage areas shall be minimized. Tree and shrub roots shall be left intact as much as possible. Cleared areas shall be revegetated to pre-disturbance conditions.

86. Work that could result in sedimentation shall stop during periods of heavy or persistent rainfall.

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87. All disturbed areas with potential for erosion or sediment delivery to the Cataraqui River shall be immediately stabilized using temporary erosion and sediment control measures that shall remain in place until vegetation or other long-term erosion and sediment control measures are fully established and functioning. All exposed areas must be covered with erosion control blankets or other measures such as mulch to keep the soil in place and prevent erosion until vegetated.

88. An Erosion and Sediment Control Plan as part of the Environmental Management Plan, will be prepared for the Project and submitted to the relevant authorities and must be approved prior to construction activities onsite. The Plan will be prepared based on guidance provided within PCA's ESG documents. The ESC Plan shall:

- Focus on erosion control as the primary mitigation measures and sediment control as the secondary mitigation measure;
- The focus of the EMP will be to reduce the amount of sediment laden water produced;
- Be tailored to the type of sediment found onsite.
- Specify the area to be controlled. In addition to the construction site, it is necessary to identify adjacent areas that could be negatively impacted by construction activities;
- Specify drainage areas and patterns based on pre-construction topography and construction design;
- Specify how clean storm run-off will be diverted around the site and away from exposed areas, with a focus on separating offsite and infiltrating water into the construction site from construction activities and sediment sources.
- Specify how sediment-laden run-off will be directed to detention or retention facilities on-site, with the understanding that large drainage areas can produce a significant amount of run-off, resulting in a need for large detention or retention structures;
- ESC controls must be designed and constructed specific to the necessary design discharge;
- Specify temporary and permanent erosion control needs for all drainage channels;

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- Take into consideration the Project schedule in selecting, designing and laying out environmental controls;
  - Include consideration of seasonal requirements; select and design controls and practices for controlling erosion and sedimentation including during shutdown periods;
  - Specify contingency planning in the event that erosion and sediment control measures are not functioning properly and need to be adjusted, improved or enhanced.
89. The size of particles present in the sediment is a key consideration for selecting the appropriate sediment treatment option(s). The ESC Plan must consider:
- If the sediment consists primarily of gravel or sand, which are relatively large particles, a single treatment using a more basic technology, such as a sediment trap or sediment bag, may be adequate.
  - If the sediment consists of silt and/or clay or concrete fines, which are relatively small particles, the effluent will most likely need a more advanced technology, such as a filter press or chemical treatment with anionic flocculent and a filtration method.
  - If the sediment consists of a large spectrum of particle sizes, the water may need primary treatment to remove larger particles, followed by secondary treatment to remove finer particles
90. In advance of land clearing and installation works, the following will be installed:
- Erosion and sediment control measures shall be implemented prior to work and maintained during the work phase, to prevent entry of sediment into the water where site access or other activities cause exposed soil.
  - Pre-fencing along the riverbanks of the east and west side lands to prevent sediment movement and erosion outside of the work zone areas.
91. Install and maintain sediment fencing for spoil stockpiling or fill materials, and further ensure that such areas are at least 30 m away from the watercourse.
92. Temporary ditches and permanent stormwater drainage and management facilities to drain all temporary access roads to permanent on-land stormwater management facilities for treatment (sediment removal) and release in accordance with regulatory requirements.



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93. Any stockpiled materials shall be stored and stabilized a safe distance away from any watercourse, drainage course or swales to prevent erosion and subsequent entry into the water body or removed from the site, in accordance with all federal, municipal and provincial regulations.
94. The construction site entrance from the public road shall be stabilized, as per standards set in Sediment Control (ESG-2-Pre), using temporary tracking pads or mud mats and must be designed in combination with other ESC measures and in combination with vehicle wash facilities (as required). Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
95. The tracking of mud onto local streets will be monitored during construction. If mud accumulates on the streets, the Proponent will be required to implement additional systems to prevent its transfer to local storm drains. This could potentially include wheel washing areas at the exit from the construction site or end-of-day street scraping/sweeping to remove accumulated materials from local streets.
96. Flow dissipaters and/or filter bags, or equivalent, will be placed at water discharge points to prevent erosion and sediment release.
97. Only clean materials with  $\leq 2\%$  fines shall be placed in or near water where it has been previously planned and authorized.
98. All spoils will be contained and isolated from the clean causeway material.
99. No acid-generating rock (containing sulphides) will be used;
100. Any water containing a high level of silt or sediment will be treated by discharging to settling basins, vegetated areas or sediment traps prior to release to streams (to be identified in a Construction Water Management Plan). Water treatment facilities will be equipped to treat clay. Water quality downstream of construction activities and turbidity curtain will not exceed guidelines on water quality.
101. CCME Canadian Water Quality Guidelines for the Protection of Aquatic life will form the baseline for water and streambed quality monitoring and assessment. (For full monitoring table and thresholds see Section 8).
102. Activities causing turbidity or release of sediment will comply with the CCME guidelines on Total Particulate Matter (Canadian Council of Ministers of the Environment, 2002).



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103. Sediment treatment areas must be designed to have sufficient capacity to remove fine sediments from water prior to being released; flocculants for settling fines may be necessary due to the nature of particulates. Rock check dams will be used to control runoff. Granular construction work areas have been installed to minimize the extent of disturbed ground.
104. In order to prevent construction waste such as metal debris, sawdust, concrete cuttings/debris and other fine waste materials from entering surface waters the Contractor will adequately contain all debris materials within the construction area and remove all debris as soon as possible (see Appendix B for detailed construction methodology).
105. A turbidity curtain forming part of the AETC will be installed and maintained around the causeway in order to maintain turbidity levels below acceptable limits.
106. Isolation of the trestle piles will be required until such a time that it can be demonstrated that turbidity will be controlled in accordance with the requirements specified in Section 4.14.1. As described in Section 1.5.6 the installation of the trestle will require piles to be driven to access the navigation spans and back spans, as well as Piers 17 through 19 (locations provided in Figure 1.2). As presented in the Construction Schedule (Section 1.6) trestle installation will begin at Span 20, where two piles will be installed within the turbidity curtain (which forms part of the AETC) as follows: ensure full settlement after causeway installation prior to commencing pile driving/use of vibratory hammer; monitor turbidity in accordance with the limits set out in Section 4.14.1; evaluate whether isolation will be required for the installation of the remaining piles. The location of these two piles are shown in the Trestle / Causeway Transition Details Drawing in Appendix B. If turbidity levels exceed the limits identified in Section 4.14.1, isolation of the area will be implemented by installing a turbidity curtain on the trestle template.
107. For the purposes of managing turbidity, the Proponent will provide a marine grade turbidity curtain - US DOT Type 2 or approved alternative by FAs- across all areas where sediments can enter the watercourse.
108. Construction Water Management activities will use appropriate treatment components and return clean water to the river. In the event that turbidity remains high after treatment, settling areas within curtains may need to be cleaned (i.e. sediment removal) prior to curtain removal.

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109. Turbidity curtains will be designed to suit the local hydraulic and wind conditions, and to fully enclose the working area, extending to the river bottom. These curtains will undergo daily visual inspection to ensure they function properly, and no gaps have developed.
110. Sediment/turbidity curtains shall be deployed in a manner – e.g. moved in a direction from close to shore/structures outward – that prevent entrapment of fish inside the curtain.
111. Installation of all turbidity curtains and causeway must be conducted in a manner than minimizes disturbance of substrate on the bed and banks of the river.
112. The method of causeway placement has been designed to reduce distribution of fines into the waterway and prevent segregation of granular material compared to end dumping directly into the river. The placement of causeway material will take place via dump trucks unloading on the previously built causeway surface and progressively pushing the material through itself to extend the causeways and platforms with a bulldozer and trained operator.
113. Erosion and sediment control measures shall be left in place until all areas of the work site have been stabilized. Erosion and Sediment controls shall not be removed without acceptance from PCA.
114. Sediment control measures and exclusion fencing must be removed in a way that prevents the escape or re-suspension of sediments.
115. Environmental protection measures shall be checked after each extreme weather event.
116. Upon completion of the work all debris shall be completely removed, and the area restored to its original state or better. Repair all damages to property due to Project activities.
117. The Proponent will maintain a standby supply of erosion and sediment control materials .

#### **4.12 Refueling and Spill Management**

118. Refueling and Spill Management shall be conducted according to PCA's ESG Document ESG-13-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

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119. A Spills Preventions and Emergency Response Plan shall be in place prior to initiation of construction. The plan must be posted in an accessible location a spill response plan that includes contact information for the FAs responsible for the work and applicable spill response agencies. The Proponent must also have a plan in place to notify municipal authorities and the public for incidents above a pre-determined threshold, such as if a sheen is observed in the receiving environment and the sheen can be linked to the Work Area.
120. A Spill Response Plan must also include at minimum the following information:
- List of products and materials considered or defined as hazardous or toxic to the environment as per the Canadian Environmental Protection Act, Transportation of Dangerous Goods Act and Workplace Hazardous Materials Information System). Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot poured rubber membrane materials, asphalt cement, sand blasting agents, paint, solvents and hydrocarbons.
  - Required equipment on site.
  - Size, type and location of spill kits.
  - Equipment maintenance and inspection procedures
  - Staff roles, responsibilities
  - Fueling procedures, fuel storage.
  - Spill prevention procedures (i.e., containment and storage of materials, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation).
  - Spill response procedures including the following 4 steps:
    - Control/contain the spill,
    - Immediately notify the MECP Spills Action Centre (SAC) 1-800-268-6060 of any spill,
    - Clean up the spill immediately Advise the Proponent, Parks Canada Project Manager and;

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- Document actions taken.
  - For in-water spills, continue to monitor pH/turbidity levels downstream of project location and at established publicly accessible locations further downstream to determine the scope and duration of the spill.
  - Spill reporting procedures. Parks Canada must be notified in the case of all spills. Remediation and clean up actions must be completed in accordance with federal regulatory requirements and to the satisfaction of Parks Canada. Documentation of remediation, testing and results will be provided to Parks Canada.
  - Up-to-date emergency response contact list including contact information for reporting spills.
121. A spills kit shall be maintained on site and the Proponent will ensure that adequate additional resources are available. Multiple spills kits (number to match the scale of the Project and to isolate a contaminated area) shall be placed in covered, accessible structures around the construction site.
122. All personnel will be trained to report and respond to a spill, including roles and responsibilities, locations and contents of spill kits, and use of equipment.
123. All refueling and fuel storage shall be conducted in accordance with the Project's Environmental Management Plan.
124. All materials and equipment used for the purpose of site preparation and Project completion shall be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum productions, debris etc.) from entering the water. Ensure measures are in place to minimize impacts of accidental spills.
125. Vehicle, heavy equipment, and machinery refueling shall be conducted in a designated, flat, and low-sensitivity area and will not be located within a Source Water Protection Zone. The Project Location is within the Cataraqui Source Protection Area (Figure 2-22), approximately 5 km northeast of the Point Pleasant & Kingston Central Intake Protection Zones and approximately 5 km southwest of the Cana Wellhead Protection Area.
126. Refueling of easily moveable equipment (i.e. forklifts) will not be permitted on the causeway. Where refueling on the causeway can not be avoided, re-fueling trucks will be inspected prior to being permitted to enter the causeway. Other

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measures to address leaks and spills must be identified in the EMP and implemented (e.g., ground protection mats or rig mats).

127. Designated refueling areas shall be constructed with impermeable containment such as berms, booms, and liners. They shall contain an adequately sized drip tray or other impermeable layer to capture and contain drips from the nozzle and minor spills. Snow and water must be managed from the drip trays to prevent contamination of the water. Drip trays must be on level ground. Any contaminated soil or aggregate must be disposed of properly.
128. Spill containment for refueling shall be sized adequately to accommodate the volume of the fuel source container. A spill contingency response kit including sorbent material and berms to contain 110% of the largest possible spill related to the work must be available on site at each location of potential spills (sites where equipment is working and at re-fuelling, lubrication, and repair locations).
- The use of small volume fuel cubes is preferred for refueling immobile equipment and equipment operating in or near water.
  - Gas generators must be secured to prevent movement during operation and set up on an impermeable fuel mat with a berm or within a container that can contain 110% of the volume of fuel in the generator.
  - Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads.
  - Petrochemical products, paints and chemicals must be stored a minimum of 30 m away from waterbodies, high traffic areas and, if left overnight, they must be secured. Machinery must be stored, maintained and refueled on a flat surface, outside the dripline of trees and a minimum of 30 m from waterbodies, as measured from the High-Water Mark. Increase the buffer zone depending on level of risk and site-specific conditions.

Where the above practice is impractical, ensure the following measures are employed:

- A spill tray or absorbent pads are to be placed under or around the fueling point.
- When unreeling the fuel transfer hose and nozzle, the nozzle must be in the upright position. The nozzle shall be kept clear of the ground when returned to the reel or storage position.



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- Do not place hose connections over/across/in waterways or fuel equipment on barges, watercraft or flexi-floats from the shore.
- Portable containers shall not be filled while located on a watercraft. Remove the container and bring to shore.
- Only double-walled Transcube type tanks are permitted to be transferred over water from one location to another. These tanks are engineered and equipped with proper lifting points.
- Wastes that are generated from remedial operations that are considered to be hazardous wastes under Ontario Regulation 347 of the *Environmental Protection Act* must be contained in sealed containers and temporarily stored on site until they are collected for disposal by a licensed waste hauler.
- All other non-hazardous waste generated by a concrete pour operation shall be disposed according to Ontario Regulation 558/00. R.R.O. 1990 (General – Waste Management).
- In the case of a spill, the Project's Spills Preventions and Emergency Response Plan shall be implemented and the spill management and reporting shall be addressed as specified in PCA's ESG Document.
- In the event of a spill, remediation will be conducted immediately contain and clean up in accordance with federal regulatory requirements and to the satisfaction of PCA. A logbook detailing all spills will be maintained and documentation of remediation, testing, and results will be provided to PCA.
- Any spill on land meeting the criteria set out in Ontario's Environmental Protection Act, O. Reg. 675/98 must be reported immediately to the MECP SAC at 1-800-268-6060 and the provincial authorities notified. Should the spill have the potential to enter federal lands or waters, the Federal Authorities will also be notified.
- The Proponent shall undertake all work in a manner than minimizes the potential for accidental spills or the releases of water from the work area.
- All spills must be contained and cleaned-up as soon as it is possible to safely do so. In the event of a major spill, all other work must stop until the spill has been adequately contained and cleaned up.

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- Contaminants must be recovered at source and disposed of according to applicable laws, policies and regulations. The site will be inspected by Parks Canada staff to ensure completion to expected standards.
129. Proper on-site construction signage and controls (including traffic and in-water navigation markers) are installed and maintained for designated areas and to ensure safe and efficient construction traffic circulation on-land and in-water and prevent vehicle collisions.
  130. Temporary on-site effluent holding tanks will be pumped out regularly and hauled to an approved water pollution control plant for disposal and treatment.
  131. There shall be no discharge of chemicals, cleaning agents, waste and volatile materials in or near aquatic habitats; all such substances shall be disposed of at a facility licensed to receive them.
  132. No tools, equipment, temporary structures or parts thereof, used or maintained for the purpose of this Project, shall be permitted to remain at the site after completion of the Project.
  133. Any required cleaning of tools and equipment must be done off-site. If it must be on-site, it must be in an appropriate area at least 30m from a waterbody
  134. The Third Crossing Project Team has been working with emergency management services such as Kingston Fire and Rescue, Kingston Police Force, and Kingston's Ambulance Services. A workshop was held recently between the EMS and the Project team's safety experts to go over construction activities and emergency scenario planning. The EMS and Project team will work together to coordinate any necessary fire, police and ambulance requirements and update emergency response plans for unplanned events both in-water and on the bridge for both construction and operation phases. Kingston Fire and Rescue has sufficient resources and equipment (nearby fire hydrants, water trucks, fire boat, and trained fire/rescue personnel) to address fires and rescue situations for the Project. 24-hour emergency and spills contact lists, road detour information, spills protocol, communication and crisis situation protocols, as well as ongoing emergency training for all Project personnel form part of the emergency response plan for the Third Crossing. For major emergencies, the City of Kingston has an Emergency Operations Center that is activated and managed by trained staff to facilitate rapid coordination of any and all affected stakeholders of an emergency.

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#### 4.13 Contaminants Management

135. Prior to in-water work, pre-construction analyses of sediments to complement previous sediment analysis will be conducted in the riverbed in the vicinity of the temporary causeways to determine potential sediment contamination levels, and further ensure appropriate protocols are in place to support:
- implementation of in-water baseline, construction, and post construction monitoring
  - in-water containment measures and contingency planning as part of a sediment management planning
  - control measures (work stoppage and agency notification; designated / authorized vehicle wheel-washing area for egressing trucks)
  - excavated material transport to an approved landfill facility in accordance with regulatory requirements.
136. If contaminants are discovered in excess of CCME Permissible Exposure Limits within the construction area, measures and procedures outlined in the Surface Water and Erosion and Sediment Control Plan as well as the Soil Management Plan will be implemented. These plans address specific concerns in regard to presence of contaminants and will be implemented once approved by PCA. Specifically, the Soil Management Plan will also provide guidance for management, testing, manipulation and disposal of potentially contaminated riverbed substrates.
137. If contamination is discovered, material removed from the riverbed or exposed to contaminated sediment during the work may not be reused as backfill material unless assessed for the applicable MECP soil criteria. Where material removed exceeds that criteria, it must be disposed of at an appropriate offsite facility. If necessary, material will be temporarily stockpiled in an isolated location to prevent contaminant release into the waterway.
138. If contamination is discovered, workers are expected to wear appropriate personal protective equipment (PPE) to minimize potential exposure to sediment, soil, groundwater and surface water in Project area. Appropriate PPE will need to be determined by a qualified professional specific to the exceedances discovered onsite, the construction activity occurring onsite and their related human health risks.



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139. If contamination is discovered, the wash-off material (from workers and their PPE) must be contained and disposed of offsite. Wash water must not be allowed to enter any waterbody either directly or through a storm sewer. Proponents are also expected to be familiar with applicable health and safety requirements for workers in regard to the contaminants identified.
140. If contamination is discovered, sediment controls and water quality discharge criteria must be reassessed in order to address potential risks to human health and the environment. This may include an amendment to this DIA and inclusion of additional mitigation measures prior to in water work.
141. In the event that the Proponent's selected methods for control of suspended particulates in discharge waters involves the use of flocculants, the Proponent must provide a toxicity evaluation of the specific commercial formulation intended for use and shall use that flocculent in a manner that does not result in toxicity.
142. Material imported to the site must be tested for potential contaminants of concern (e.g., metals, hydrocarbons) and confirmed to be "clean" (i.e., meets sediment quality guidelines).
143. Sediment quality will be monitored post construction to determine if it has had an impact on the horizontal and vertical distribution of contaminated sediments. Post construction sampling to be completed and will be compared to levels observed during baseline sampling completed prior to construction.

#### **4.14 Water Quality**

144. The Project has proposed a surface water monitoring program to be implemented during the construction period (Section 8) parameters to be monitored include those most likely to be affected by construction activities such as turbidity, pH, total suspended solids, temperature, dissolved oxygen and conductivity. The parameters will be evaluated against the federal water quality standards for the protection of aquatic life (Canadian Council of Ministers of the Environment, 2002).

##### **4.14.1 Turbidity**

145. Monitor water quality for suspended sediment levels exceeding identified requirements during all work activities. Monitoring and testing will be adaptable to changing site conditions and will capture any event/incident for the length and scope of that event.

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146. During the allowable fish in-water work timing period the following applies:

- The TSS/NTU turbidity relationship of 3:1 as outlined in CCME (1999) (for example, the TSS of 25 mg/L value will be associated to 8NTU), (Golder, 2018).
- The discharge point is defined as the interface of the work site and the waterbody. This will be determined in consultation with the relevant authorities and described within the EMP.
- For a <24-hour exceedance of 25 mg/L above background (when an absolute maximum TSS of 75 mg/L at the point of discharge has not been exceeded) the work area and methods must be reviewed to determine appropriate mitigations to manage TSS.
- For a >24-hour exceedance of 25 mg/L above background (when an absolute maximum TSS of 75 mg/L at the point of discharge has not been exceeded), the Proponent must stop the work, inspect the work area, and review their work procedures to determine appropriate mitigation actions. Once the mitigations are implemented, work can resume.
- In the event that TSS in the receiving environment is on average >5 mg/L above background during a 30-day period, the Proponent must inspect the work area and review their work procedures to determine appropriate mitigation actions.
- In the event that the maximum TSS value of 75 mg/L (or 25 NTU) is exceeded at the point of discharge (irrespective of background), or TSS is <75 mg/L but more than 25 mg/L above background for >24 hours, the work must be stopped, and the Work Area and methods reviewed to determine appropriate mitigations to reduce TSS. Once the mitigations are implemented, work can resume.
- In the event of an accidental release of sediment-laden water with a TSS concentration of 75 mg/L or greater follow the Water Quality/Sediment (Toxicity) Monitoring specified below
- In the event that TSS is lower than 75 mg/L at the point of discharge (irrespective of background) but more than 25 mg/L above background for <24 hours, the Work Area and work activities must be reviewed to determine appropriate mitigations to reduce TSS.

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147. During the restricted timing period for fish spawning (March 15 to June 30) the following applies:

- For a single exceedance of 5 mg/L above background beyond 5 meters of the discharge point, work must stop, and methods must be reviewed to determine appropriate mitigations to manage TSS.

#### 4.14.2 pH

148. Monitor water quality for pH levels exceeding identified requirements during all work activities.

149. All concrete pours in or near water must have a Qualified Professional on site to monitor downstream surface water turbidity and pH and assist in mitigating the effects of a concrete release.

150. Water pH shall be monitored frequently in the intake of discharge pump, holding tank, outflow, and/or downstream of the isolated work site or discharge point until the works are completed. Monitoring of water outside of isolated area of a work or discharge point shall be undertaken at 100 m, 200 m, and 400 m or as directed by PCA and agreed upon within the EMP. In addition, waters within the isolated work area for a Tremie pour operation shall be sampled. Monitoring and testing will be adaptable to changing site conditions and will capture any event/incident for the length and scope of that event.

151. Water pH monitoring must be conducted by a Qualified Professional using a digital pH meter with an accuracy of +/- 0.2 pH units.

152. pH will be maintained between 6.5 and 9.0. Water with pH > 9 cannot be released directly back into the watercourse but must be treated prior to release. Water with a pH ≥ 12.5 is considered toxic and treated as a hazardous waste under Ontario Regulation 347 of the *Environmental Protection Act* and wastewater in this condition must be removed from the site.

#### 4.14.3 Construction Water Management/Wastewater Treatment

153. Construction water management and sediment control shall be conducted in compliance with all PCA's ESG requirements, particularly ESG-10-C. Discharge waters shall be treated according to PCA's ESG Document ESG-14-C and shall be in compliance with the criteria detailed by the EMP. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

154. Turbid/waste water shall not be pumped and discharge directly into the waterway. Water taken during drilling events will be treated onshore and returned

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to the river provided it meets the CCME Water Quality Guidelines for the Protection of Aquatic Life. Pumps will be appropriately sized and discharge flow will be controlled. The discharge location shall have a flow meter to monitor and track the flow.

155. Discharge water to the river must not be allowed to scour or cause erosion at the discharge location. Where practical, the discharge location shall be located directly over the river to eliminate any overland flow that may cause scour or erosion. When discharging water overland, dissipaters will be used as required to reduce runoff velocity and dissipate the energy of concentrated flows. These dissipaters can be constructed or rip rap, sandbags, gravel or other non-erodible material. The erosion control measures shall be inspected before, during and after discharge to identify and document potential issues. Any issues with sediment and erosion control measures shall be repaired or replaced immediately to ensure it is working as intended.
156. Clean water (<2NTU above background) may be pumped from the enclosed Work Area to the river.
157. Construction Water Management activities and outlet from active treatment system will be undertaken so as not to erode or destabilize the bed and banks of the watercourse or contribute to sediment loading to aquatic habitat.
158. Details of the filtration system and outflow will be provided by the Proponent and reviewed by PCA.
159. An alternative means of treatment or disposal of impacted water must be identified prior to commencement of the work in case the water quality discharge criteria cannot be met or water in the enclosed work area is found to be acutely lethal to fish.
160. Waters to the north and south of the Project Location shall be routinely tested for turbidity and pH and compared to background to confirm compliance with performance standards. General monitoring procedures are detailed in PCA's ESG Document ESG-14-C, while site-specific procedures are detailed in Section 8.0. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
161. Where not superseded by guidelines developed by site-specific studies, CCME CWQG and the Ontario PWQO will be used for the development of the exceedance limits detailed in the EMP.

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- 162. Monitor water quality over the duration of the Project.
- 163. Uncontrolled sediment entering any nearby waterbody will be considered a spill and must be reported to FAs and the MECP SAC.
- 164. Construction Water Management, demolition, and construction is staged such that clean water is pumped back to the system and turbid water is managed through a wastewater system.
- 165. Adequate and properly maintained pumping tools, equipment as well as manpower to monitor and inspect the work areas shall be required throughout the construction period.

#### **4.15 Site Clean-up and Waste Management**

- 166. All waste materials will be handled and disposed of in accordance with the Project's EMP, and the City of Kingston Waste Management By-law (2014-5).
- 167. Provide on-site containers for collection of waste materials and debris.
- 168. General clean-up will be conducted daily to the full satisfaction of the relevant authorities, progress cleaning must be in accordance with the Proponent's EMP, and no undue amounts of debris, trash and/or garbage will be allowed to accumulate.
- 169. Rubbish, debris, and garbage from all construction activities is to be removed off site on a weekly basis.
- 170. All waste generated will be disposed according to regulations (i.e., O. Reg. 347, and as amended).
- 171. Materials will be sorted for reuse and recycling, as appropriate.
- 172. Potentially hazardous waste will be separated from normal waste through segregation of storage areas and proper labelling of containers. All registered waste will be removed from the site by licensed waste Proponents and disposed at approved facilities.
- 173. All wildlife attractants must be secured (e.g., petroleum products, human food, recyclable drink containers and garbage) in wildlife-proof containers, a secure building or vehicle. When possible, keep food waste separate from construction waste and remove daily.
- 174. Contain and stabilize waste material (e.g., construction waste and materials, vegetation) at a minimum of 30m from a waterbody.



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175. Burning is not permitted within the protected heritage place unless approved by Parks Canada.
176. If present, portable sanitary facilities must be serviced on a regular basis and accumulated waste disposed of at a sanitary waste disposal facility. The portable facilities must have sufficient capacity and be managed to ensure waste is not discharged to the receiving environment.
177. In order to mitigate against accidental fires, all cigarette butts will be disposed of in appropriate containers and must not be disposed of in the Cataraqui River or on the ground.
178. Follow all applicable regulations and codes for the management and handling of hazardous waste. Only licensed individuals will be used to haul or transport hazardous waste
179. If hazardous waste or potentially contaminated material is uncovered during excavation / construction, work must stop and excavated materials must be secured onsite in a manner that prevents contamination of the surrounding environment, including leaching. The designated Parks Canada staff must be contacted for further direction.
180. Removal of sediment control measures will only be undertaken upon approval of relevant authorities.
181. The turbidity curtains shall be carefully removed from the waterbody so as to avoid disturbance of the bed and banks.
182. The bed of the waterway is to be cleaned of any construction debris and restored to original state and grade upon completion of work within the waterway, with the exception of 100 mm below grade of causeway rock.
183. Turbidity curtains must be in place while removing the causeway.
184. Allow time for sediment to settle, and when feasible remove sediment, prior to removal of turbidity curtains and ensure target concentrations of suspended solids are met.
185. Silt or debris that has accumulated around the temporary causeway and turbidity curtains shall be removed prior to their withdrawal.
186. During causeway commissioning, adhere to the EMP

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#### **4.16 Revegetation and Site Restoration**

187. The following mitigation measures apply to lands administered by the Federal Authorities. Any revegetation or site restoration outside of lands administered by the Federal Authorities must be permitted by the relevant authority.
188. During the establishment period of the new plants, the plants will need to be watered (weather dependent) at minimally every 7 to 10 days or preferably every 2 to 3 days between May 1 and August 30, and minimally every 14 to 21 days between September 1 and November 15.
189. Watering should be enough to penetrate the full depth of the growing medium.
190. Soil moisture must be monitored throughout the growing season and the frequency of watering must be increased when plant materials are reaching the permanent wilting point. Scheduled applications of water must be skipped when rainfall has penetrated the soil fully.
191. Seed mixes must be applied with a suitable tackifier or covered by erosion control materials to reduce potential washout of seeds.
192. Upon Project completion, the proponent is responsible for the removal of all temporary access roads and structures.
193. All materials used to construct the aquatics exclusion and turbidity curtain shall be removed and disposed of off-site following the completion of the works or completion of construction phase.
194. Develop revegetation objectives in terms of short-term and long-term goals:
195. Short Term: stabilize the ground surface at all disturbed areas.
196. Long Term: restore the site and work areas to a specific future state or for a specific end use (e.g., public use, recreation, wildlife habitat), including any remediation, if required.
197. Placement of topsoil over disturbed lands shall be undertaken to provide a suitable growing medium. Most of the soil to be used for this purpose must come from on-site topsoil stockpiles (See Invasive Species Management ESG-11-C). Typically, topsoil is not applied to slopes greater than 2:1.
198. Shortfalls in stockpiled topsoil will be supplemented with purchased topsoil.



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199. Suitable sub-soils must also be used for revegetated areas if the native fill has been removed.
200. Necessary ESC practices must be established prior to dewatering.
201. Follow seeding specifications.
202. The use of fertilizers is prohibited. Compost will be considered the first option where fertilizers would otherwise be utilized. Compost must be weed-free or from a facility where temperatures have rendered seeds non-viable.
203. Riverbed, banks, and staging areas shall be restored to pre-construction conditions or better at the end of works.
204. Imported material must be tested for a minimum analytical suite consisting of metals, PHCs, and PAHs. Additional parameters may be analysed at the discretion of the proponent's Qualified Professional.
205. Embankment fill must be properly moisture conditioned and compacted.
206. All disturbed areas will be restored via hydroseeding.
207. Once the site is stabilized ESC measures and exclusion fencing must be removed in a way that prevents soil erosion and sedimentation.
208. Revegetation inhibits growth of invasive species; however, invasive species must be monitored and controlled to promoted successful establishment of native species.
209. If there is insufficient time remaining in the growing season, the site must be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
210. Monitor site and replace plants as needed to meet target densities.
211. No tools, equipment, temporary structures or parts thereof, used or maintained for the purpose of this Project, shall be permitted to remain at the site after completion of the Project.
212. Areas of insufficient germination or where erosion is evident will be repaired or reseeded.
213. The shoreline will be monitored for signs of erosion and restorative action will be taken as necessary.



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#### **4.17 Health and Safety**

214. During winter work, workers shall plan and dress for the following conditions:
- Temperatures as low as -30°C for an extended period of time;
  - Heavy snow falls throughout the winter; and
  - Strong winds, with gusts, due to the openness of the site.
215. With respect to extreme weather conditions (heat or cold) workers shall adhere to guidance in the Project-specific Safety Plan regarding frequency of breaks to cool down or warm up as needed.
216. Implement the EMP - Contingency and Emergency Response Plan as needed.
217. Toxic / hazardous materials (e.g., fuel, oil, concrete, etc.) will be used / present on site. Handling of such materials must be minimized to the extent possible.
218. Only workers with the necessary training shall use carbon dioxide tanks during normal concrete pour operations.
219. As applicable to job tasks, employees shall be trained in Working at Heights and wear the necessary personal protective equipment as appropriate.
220. All employees must be trained in the identification of poisonous plants, including species which are known to occur on site, e.g., Eastern Poison Ivy, and those which are known to occur in the region, e.g., Giant Hogweed and Wild Parsnip.
221. The Proponent shall maintain a Project-specific Safety Plan, reviewed by all on-site workers and available on site for the duration of the Project.
222. Daily tailgate meetings shall be conducted prior to commencement of work each day to conduct a risk assessment for each scheduled activity and address hazards.
223. All work shall be carried out in accordance with the Project-specific Safety Plan and any negligence or non-compliance will lead to stoppage of works at Proponent's risk and cost.
224. Make medical provisions prior to Project's start for prompt medical aid in the event of serious injury.

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225. Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
226. Workers are to wear personal protective equipment (e.g., safety work boots, respirators, hard hats, etc.) and comply with all aspects of the Project-specific Safety Plan.
227. Maintain safe ingress and egress to work areas.
228. Adhere to federal, provincial, and municipal requirements relating to the safety, health, and protection of workers and the environment.
229. Comply with requirements of WHIMIS regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Human Resources Development Canada, Labour Program.

Transport hazardous materials and wastes in accordance with *Transportation of Dangerous Goods Act*, *Transportation of Dangerous Goods Regulations*, and applicable provincial regulations.

#### 4.18 Weather / Environment

230. Winter Weather Stabilization and Operations shall be conducted in accordance with PCA's ESG Document ESG-18-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
231. Schedule work to avoid wet, windy, and rainy periods that may increase erosion and sedimentation.
232. Appropriate controls will be employed to protect the work from damage caused by ice, flooding, wind, and other adverse climatic conditions; e.g., ensure suitable site drainage, properly store and handle materials for windy conditions, etc. The Causeway working surface is designed to elevation 76.5m, which is 0.5m higher than the 100-year flood level to accommodate floods and wave action. The trestle is designed similarly, so the superstructure is 76.5m and higher. This is intended to eliminate flood concerns. Runoff issues are mitigated by either a bull rail or berm, depending on the location along the access. Extreme weather events will be monitored by Project staff. If extreme winds or weather conditions are forecasted, materials and equipment will be secured per manufacturer's recommendations or industry standards. Some examples include securing tools and plywood, booming down cranes, and moving mobile equipment to higher ground.

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233. Areas of a construction site that will remain inactive over winter (i.e., where construction activity will not occur), must meet the following winterization requirements:
234. Install and maintain effective ESC measures prior to ground freezing.
235. Install and maintain all turbidity curtains prior to ice forming.
236. All disturbed and bare soil areas will be stabilized with native vegetation, mulch, hydro-mulch with a tackifier or erosion control blankets. See Erosion Control (ESG-1-Pre) and Sediment Control (ESG-2-Pre) in PCA's ESG. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
237. The storage and application of road salt for de-icing purposes is prohibited. Only environmentally friendly sand and de-icing products approved by PCA shall be used. Grit and de-icers must be ordered and on-site prior to first snow fall, usually in September. Follow manufacture's specifications for application of de-icing products.
238. Utilize snow blowers, snow ploughs, or other equipment to remove snow into windrows or to move snow to designated storage areas. Do not pile snow on erosion sensitive areas. These areas must be identified in the SSEMP. For snow windrows, gaps would be left at natural drainage swales to allow for cross drainage.
239. Remove snow accumulations from around flow conveyance structures such as culverts and ditches following major snowfalls to minimize ice jamming or structure failure during freeze-thaw cycles.
240. To avoid flooding during spring melt, snow disposal areas must not be placed on high ground. site meltwater must be directed away from the snow piles and dumping area to reduce ponding / rutting.
241. Remove equipment and supplies from flood prone areas prior to snow melt and spring thaw.
242. Construct and employ suitably sized Construction Water Management systems and contingency measures for spring melt conditions.
243. Prior to spring melt each year, review the site's surface water management plan and ensure that planned water run-off areas are still appropriate.

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- 244. Salt and other road chemicals must be properly stored in designated areas only, preferably in dry sheds to prevent infiltration of leachate to the water table and surface runoff.
- 245. Accumulated snow that may be contaminated with salt must be disposed of only at approved dumpsites or designated areas.
- 246. Snow containing salt or sand must never be dumped in or allowed to melt and run off into watercourses.
- 247. Ice laden with sediment shall be removed from the Project site or stored within an isolated area, with meltwater being treated for turbidity as necessary.

#### **4.19 Fish and Wildlife**

##### **4.19.1 General Measures to Protect Fish and Wildlife**

- 248. In addition to the following mitigation measures, all work activities will be conducted in accordance with PCA's ESG Document ESG-17-C detailing Wildlife and Species Protection During Construction and the Project's EMP. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
- 249. The site must be inspected daily by a Qualified Professional to identify potential wildlife issues (e.g., hibernating animals or nursing mothers and their young, etc.) and to inform or adjust mitigation planning as needed. The timing and scope of this inspection will vary depending on the type and extent of habitat to be affected and the anticipated timing for Project activities.
- 250. Synthetic plastic Erosion Control Blankets / Mats cannot be utilized, particularly during nesting season, as they pose as an entrapment hazard to turtles, snakes and birds. Fiber-based bio-degradable Erosion Control Blankets / Mats are only to be utilized with a large open weave or no netting.
- 251. Animals must be provided a safe corridor and sufficient time to escape and/or move around the construction site. Corridors designed to facilitate species movement must be species specific and approved by the relevant authorities prior to installation.
- 252. If the species does not leave the site on its own accord take measures to ensure the species is protected from further harm (e.g., provide operator / worker awareness to avoid the location of the encounter).

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253. Notify PCA of the encounter to determine and implement required actions (e.g., if feasible, the capture and relocation of an injured species to an appropriate care facility by the Qualified Professional).
254. If a nest or breeding site of a species is encountered stop work within the area and notify a qualified professional and PCA:
- For reptile and amphibian species:
  - Contact a Qualified Professional and PCA to determine how to proceed.
255. Field information regarding incidental encounters with wildlife shall be reported on a daily basis as per PCA's ESG.
256. Consider the need for, and if necessary, install, additional protection measures aimed at excluding wildlife species from the work areas (e.g., sweeps to prevent use by Barn Swallows).
257. If recommended by a Qualified Professional and approved by PCA, conduct "pre-stressing" activities within a few days prior to the onset of site preparation (vegetation clearing and grubbing) to encourage wildlife to move away from the site. The need for, type and frequency of pre-stressing activities will consider:
- The amount and quality of information available about wildlife;
  - The size of the area to be affected;
  - The proposed timing of Project works and activities (i.e., within or outside of prescribed timing windows); and
  - The need for multiple pre-stressing events.
258. Field information regarding incidental encounters with wildlife (non-SAR wildlife) shall be compiled. If the species needs to be relocated or is visibly injured, the encounter must be reported immediately to the Environmental Manager who will contact the appropriate agencies and local wildlife rehabilitation centers. The following information must be recorded in the field:
- Locations, dates and time of day where the species were encountered.
  - Name of species encountered.
  - Photographs of the species, if taken.
  - Condition of animal.

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259. Designated PCA staff must be alerted immediately to any potential wildlife conflict (e.g., aggressive behaviour, persistent intrusion), distress or mortality. In the case of aggressive behaviour or persistent intrusion, stop work and evacuate the area.
260. Unless advance inspection and exclusion provisions (in conjunction with applicable permits and approvals being in place) have ensured that there will be no potential species impacts, activities will be scheduled to avoid confirmed or assumed habitats as well as breeding/spawning seasons and over-wintering periods.
261. If injured or dead wildlife are encountered, these will be reported to PCA immediately. PCA may require retrieval and storage on ice of carcass for laboratory testing.
262. All vehicles and equipment used by Project personnel will follow any construction zone speed limits to reduce the risk of wildlife strikes, as enforced by the site supervisor.
263. Work areas will be kept clean and free of potential hazards to wildlife such as wire, cable, tubing, plastic, antifreeze or other materials that wildlife may consume or become entangled in.
264. Cover or fence hazardous areas when left unattended to reduce the potential for wildlife injury.
265. Never approach or harass wildlife (e.g., feeding, baiting, luring).
266. An Aquatic Exclusion and Turbidity Control (AETC) feature is to be installed prior to any works occurring in-water. PCA approved preliminary in-water works for the Kingston Third Crossing Project (hereinafter referred to as the Project) on September 4, 2019 under permit Rideau 2019 8520 – 751. Rideau 2019 8520 – 751 was issued upon review of *Kingston 3rd Crossing In-Water Turbidity Curtain – Turtle Fence Scope of Work* (Kiewit - September 3, 2019). The approval was issued under the understanding that a subsequent document outlining the exclusion method for fish and turtles be submitted and approved by PCA. *Kingston 3rd Crossing Turtle and Fish Exclusion Work Method (Rev 1)* (Kiewit - September 20, 2019) was approved by PCA to fulfill the 25 conditions of Rideau 2019 8520–751. For full details on the AETC Plan refer to Appendix H. The intent of the offshore AETC is to exclude aquatic wildlife from the work area to reduce potential harm to individuals. In addition to excluding wildlife, the in-water portion

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serves a secondary function as a standard turbidity curtain to control the release of the suspended sediment particles to the surrounding aquatic environment. The AETC feature is expected exclude aquatic herpetofauna identified as potentially occurring within the Study Area (Section 2.2.5). Depending on the final configuration and installation success, the AETC may also exclude fish completely or partially from the Project Location. An evaluation of the likelihood or success of this will facilitate agency discussion as to whether work can proceed within the sensitive spring fish timing windows. The AETC will be installed surrounding the entire Project Location with ends tied to the causeways eco-passages opening to direct aquatic wildlife and fish towards the openings or the main causeway opening. The ultimate intent of installing the AETC within the fall of 2019 is to exclude turtles from overwintering within the causeway footprint, in order to mitigate potential harm during winter installation. Once the causeway is installed or if installation is occurring within the summer months, the need for the Aquatic Exclusion portion of the works becomes less critical and may be reverted to a more traditional exclusion fence being installed on the causeway itself to ensure aquatic wildlife cannot entire the work site. The turbidity curtain portion of the AETC remains for as long as is deemed necessary.

267. The specifications of Aquatic Exclusion and Turbidity Curtain (AETC), as described in In-Water Turbidity Curtain Turtle Fence Scope of Work (Appendix H) will be updated to reflect ongoing use throughout the duration of construction. The following conditions will apply:

- Turtle fence installation prior to September 15 and removal following November 15 (temperature dependant);
- Turtle fence height will be adjusted to typical 400 mm above water; and
- 300 mm embedment of extended turbidity curtain with weighting.

Specific requirements will be reviewed and approved by relevant authorities prior to implementation in 2020.

#### 4.19.2 Fish and Fish Habitat

268. To protect spawning fish, their incubating eggs and larval life stages, no in-water works shall occur during the restricted activity timing window of March 15 to June 30 of any given year unless otherwise authorized by the Ontario Ministry of Natural Resources and Forestry (MNRF), Parks Canada Agency and DFO. All action will occur in accordance with PCA's guidelines for Fish Exclusion, Salvage, and Relocation outlined in ESG Document ESG-7-C.

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269. Prior to any in-water pile driving work, noise will be used to encourage fish out of the work area. This will be accomplished by striking steel members of the floating template and adjacent piles before each pile is placed into position. During drilled shaft casing pile installation, the adjacent trestle pile will be used to create noise.
270. An Aquatic Exclusion and Turbidity Control (AETC) feature is to be installed prior to any works occurring in-water (Appendix H).
271. As described in Appendix H the proposed AETC will be installed in manner that forces aquatic biota out of the work area by installing three sides, leaving an open end and using a combination of sound, net dragging or other means to force aquatic fauna out of the work area. Depending on the thickness of the vegetation, cutting may be required prior to the placement of the AETC. It is anticipated that the interface between the river bottom and the AETC will ultimately reduce or exclude fish from Project Location under normal flow and water conditions.
272. Once the AETC is in place, a series of fish removal methodology will be deployed to encourage or remove fish from the isolated areas. Any incidental or by-catch of these efforts will be relocated outside the work area.
273. The following conditions will apply to any fish relocation efforts:
- All fish relocation efforts will be permitted by MNRF and PCA as applicable.
  - All fish captured be enumerated, measured and reported as outlined by MNRF and PCA.
  - Any fish found within the work areas will be placed outside the AETC.
  - If any threatened, endangered or extirpated SARA are encountered all works will cease, and PCA, DFO and ECCC will be notified.
  - Any large American Eel meeting MNRF's Trap and Relocate requirements will be delivered to the appropriate location.
  - All efforts will be made to minimize the length of time fish are out of the water.
274. It is understood the Project Location is within waters known to contain viral hemorrhagic septicemia (VHS). Accordingly, no water or fish will be transferred from the Project Location to any other waterbody. All equipment and clothing



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used at the Project Location will be discarded or disinfected as follows prior to moving to a new waterbody:

- disinfect with Virkon® S or a 10% household bleach/water solution;
- wash and rinse equipment 30 metres from waterbodies, dry thoroughly; and
- use different gear and equipment for inside and outside the VHS management zones and label equipment accordingly.

#### 4.19.2.1 Fish Rescue

275. Fish rescue operations will be conducted in accordance with PCA's guidelines for Fish Exclusion, Salvage and Relocation in PCA's ESG Document ESG-7-C. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

276. Implementation of a fish rescue program will require the involvement of a fisheries biologist to ensure proper capture and handling of fish. Fish shall be removed from the work area prior to construction activities occurring and released alive into the waterbody using gear suitable for the site, habitat complexity, fish species likely to be encountered (particularly Species at Risk), and fish activity as determined by a Fisheries Biologist.

277. Obtain an MNRF license to collect fish.

278. Relevant authorities shall be advised 48 hours prior to fish rescue.

279. If found, invasive wildlife species (as listed in Table 2.19 of this DIA) shall not be returned to the waterbody but will instead be anesthetized with clove oil then euthanized and disposed of according to Canadian Council on Animal Care's (2005) Guidelines on The Care and Use of Fish in Research, Teaching and Testing; this shall be reported to PCA.

280. Ensure that there is a fish screen that complies with DFO's *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater* when pumping in fish-bearing water to prevent impingement or entrainment of fish.

281. Following initial rescue operations, the presence of residual fish must be anticipated. Additional efforts to safely remove stranded individuals must continue until a rate of decline in the catch from subsequent efforts is observed and only a few individuals are caught.

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282. With the support of a trained team, fish exclusion, rescue, and relocation operations shall be conducted by a Qualified Professional with the ability to identify all resident fish species.
283. Any fish exclusion method including turbidity curtains must be monitored while the barriers are in place. If fish are observed within the exclusion area, barriers must be reinstalled, and fish rescue must reoccur.
284. Any substantial mortality event (greater than 2% of the total number of fish captured) shall be reported immediately to PCA and any fish mortalities clearly identified in fish salvage reports and daily environmental monitoring reports.

#### **4.19.3 Birds and Bird Habitat**

285. Where feasible, construction activities related to site preparation will occur outside of sensitive seasons for migratory birds (April 1 to August 31). The majority of the birds identified within Section 2 are protected under the *Migratory Bird Convention Act*. Those that are not would still be expected to be fully or partially guarded from adverse effects as a result of the overarching Migratory Bird Convention Act protections. These include protections of migratory birds and their nests at anytime with an elevated awareness during the known nesting season of April 1 to August 31.
286. Alternatively, if work in migratory bird habitat is required during the nesting season, a nest survey must be conducted by a qualified biologist immediately (i.e., within 3 days) prior to commencement of the works to identify and locate active nests of species covered by the MBCA. A mitigation plan (which may include establishing appropriate buffers around active nests) must then be developed to address any potential impacts on migratory birds or their active nests and must be approved by PCA prior to implementation.
287. Signage will be installed to advise construction staff of bird nesting presence (including appropriate setbacks from nests). Staff will be briefed on measures to take when nesting birds are observed on site.
288. Use commercially available “bird scare tape” or “flash tape”, suspended from the lower outer edges of the temporary trestle, to discourage access and potential nesting.

#### **4.19.4 Herpetofauna**

289. Project activities in potential turtle nesting areas, shall be completed outside of the turtle nesting season (i.e., no impacts to occur late May to early July).

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Project activities in potential turtle overwintering areas shall be completed outside of the turtle overwintering season (i.e., no impacts October to March). These dates may be adjusted based on temperature data and acceptance by the relevant authority

290. Alternatively, prior to the seasons, install terrestrial reptile and amphibian exclusion fencing around potential nesting or overwintering areas, including the access road and any stock piles of sandy-gravel substrate, to ensure turtles are unable to access the area for nesting, and to prevent exposure to heavy machinery and equipment.
291. An Aquatic Exclusion and Turbidity Control (AETC) feature was installed prior to any works occurring in-water (Appendix H).

#### **4.19.5 Species at Risk**

292. Conduct all work activities in accordance with the EMP - SAR Protection Plan (which must reflect the Project as designed for implementation and the most current SAR records) and PCA's ESG Document ESG-17-C detailing Wildlife and Species Protection during Construction. Deviations from specific requirements of the ESG will be provided in the EMP and approved by relevant authorities.
293. The death of any SAR individuals resulting from activities authorized by permits, shall be reported immediately to the relevant authorities along with digital vouchers (i.e., photographs).
294. If SAR fish are accidentally killed, they shall be preserved and forwarded to the local MNR Management Biologist along with field sheets, and copies provided to PCA and DFO.
295. Adhere to site-specific scheduling restrictions for the protection of wildlife, including SAR, unless activities have been authorized by relevant authorities.
296. All personnel conducting work on the site must be provided with SAR information and/or awareness training before they begin work so they are familiar with the SAR procedures including reporting requirements. Training materials must be part of the EMP, and a record of all persons provided SAR information and awareness training must be kept. The information and training must include:
- Obligations under the SARA and the ESA, and in which areas of the site these legislations apply;
  - Information about the specific species that may be present in the work area;

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- How to identify the species;
  - Habitat characteristics for the species / where species are likely to be found;
  - Potential threats and impacts to the species; and
  - EMP commitments regarding SAR protection, including the SAR encounters procedure.
  - Incidental Encounters with a SAR, a SAR nest, or SAR egg (confirmed or suspected) shall adhere to the following procedures, as specified in PCA's ESG Document:
    - Immediately cease activity within the area of the encounter.
    - Immediately notify PCA for species-specific advice and mitigation measures.
    - Do not approach or handle the species (i.e., do not harm or harass the species).
    - Identify and if possible, photograph the individual species and determine species status.
    - Work shall not resume until the species leaves the site on its own or further direction and permission to resume work is provided by PCA. Additional measures to avoid impacts may be required before work can restart.
297. SAR Recording and Reporting shall be conducted as specified in PCA's ESG. To document that the SAR encounter procedure has been followed for the purpose of demonstrating compliance, record and make available the following information:
- A description of the work or activity being undertaken;
  - The locations, dates, and times of day the activity was undertaken;
  - A list of SAR potentially affected and its condition / status during the encounter;
  - All measures implemented to avoid or minimize harm - including specific locations the best practices process was implemented;
  - The Qualified Professional assisting in implementation;
  - The duration of the work stoppage; and

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- The restart and completion dates of the activity at each location.
298. Fuelling areas must be located as far away from identified SAR habitat as reasonably possible.
- 4.19.5.1 SAR Birds
299. If Barn Swallow nesting occurs after Project start-up, PCA shall be notified. PCA will assess potential impact to the species. Additional measures to avoid impacts may be required before work can restart.
300. During the May 1 to August 31 Barn Swallow nesting window:
- Any observations of nests or nest building activity must be immediately reported to PCA.
  - Should nesting activity be observed, deterrents will be employed. Deterrent materials, which could include commercially available “bird scare tape” or “flash tape”, must be on hand for May 1 in case quick deployment is required.
  - Nesting attempts in the portion of the structure to be demolished will be removed. Any nest greater than 50% complete, as determined by a qualified biologist, will be considered a functioning nest and cannot be destroyed.
301. Prior to the regional breed bird season (April 1 to August 31), soil stockpiles must be made / maintained, so they are unsuitable for Bank Swallow nesting. This must be accomplished by sloping off stockpiles and reducing slopes to 70° or less or grading and mechanically altering the slopes on extraction faces, as this is the only approach considered consistently effective at deterring Bank Swallows from nesting.
- 4.19.5.2 Blanding’s Turtle, Eastern Musk Turtle, Midland Painted Turtle, Northern Map Turtle, Snapping Turtle
302. The EMP must detail procedures (e.g., exclusion fencing as detailed in Appendix H) for preventing turtle entry / nesting within disturbed Project gravels / soils during all stages of Project activity.
- 4.19.5.3 Monarch
303. If milkweed plants are found in an area of impact, then as a precautionary measure, for the protection of Monarch larvae, plants must be pulled and moved to non-affected areas where milkweed is growing.
304. Milkweed seeds will be included in the mix procured for site restoration activities.

#### 4.20 Vegetation

305. All work activities will be conducted in accordance with the EMP and PCA's guidelines for Vegetation Clearing and Protection in PCA's ESG Document ESG-5-Pre and the guidelines for Soil Stripping, Grubbing, and Stockpiling in PCA's ESG Document ESG-3-Pre. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

With respect to clearing and grubbing:

306. Clearing of vegetation shall be minimized to the extent possible and shall only be conducted using tools designed for tree cutting activities (e.g., chainsaw, brush saw).

307. Before commencing any clearing, grubbing, or other preparations of site, the edge of the disturbed area must be established and marked on-site by qualified arborist. Every effort must be made to preserve limbs and root zone of mature trees infringing on excavation zone. Retain selected significant groupings of trees where possible.

308. All vegetated areas to be cleared must be identified in the EMP and accepted by relevant authorities.

309. Vegetated areas to be protected shall be delineated with flagging tape, temporary protective fence, hoarding or other suitable protection measures.

310. Prune limbs close to the tree trunk. For a clean cut, make a shallow undercut first, then follow.

311. Vegetation clearing shall be undertaken in accordance with the Canadian National Master Construction Specification Section 31 11 00 – Clearing and Grubbing. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

312. Staging and sequencing of vegetation clearing shall be planned to coincide with construction activities and the installation of ESC measures.

313. Burning of vegetation or other debris is prohibited.

314. Revegetation of all exposed soils shall be undertaken using Ontario native seed mixes, matching existing native species growing on the site, and to include milkweed, as soon as practicable and accepted by PCA – no more than 5 days following the completion of watercourse works, to reduce the risk of soil erosion

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and sedimentation and promote long-term naturalization to original condition or better.

315. Upon Project completion, or earlier if feasible, stabilize soil to prevent its erosion and transport as per the site-specific Restoration Plan. Scheduling of work shall be such that exposed and disturbed areas can be seeded during the growing season and are not left exposed during the spring period.
316. Following Project completion, or earlier if feasible, implement the site-specific Restoration Plan. Restore disturbed areas with native vegetation, matching existing native species growing on the site, to promote long-term naturalization to original condition or better.
317. If trees are to be removed from the bank, bank erosion will be reduced by leaving a minimum of 60 cm stump in place, where possible
318. Adhere to the guidelines for Soil Stripping, Grubbing, and Stockpiling in PCA's ESG Document ESG-3-Pre. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.
319. Restrict topsoil stripping to areas that will be disturbed by the construction activities.
320. Ensure full salvage of topsoil and upper root zone while avoiding admixing soil layers. The stripping depth is assumed at 0.3 m.
321. All areas to be grubbed and their timing must be identified in the EMP and accepted by relevant authorities.
322. Grubbing must not be conducted unless a Site Restoration Plan, has been and accepted by relevant authorities.
323. Unless specified otherwise in the Historic Canals Regulations Permit, clearing and grubbing operations shall adhere to the Canadian National Master Construction Specification Section 31 11 00 – Clearing and Grubbing, and OPSS 201 Guideline for “Clearing, Close Cut Clearing, Grubbing, Removal of Boulders and Mechanical Stump Cutting”.
324. Grubbing must not proceed too far ahead of construction to limit the time that the mineral soil is exposed to erosion.
325. Cleared and grubbed material shall be stockpiled in separate locations from growing medium stockpiles. Where noxious or undesirable weeds are found on

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site, grubbed materials shall not be used as a constituent of, or as a growing medium.

326. Remove material and debris and dispose of at an authorized disposal site.
327. Tree pruning and removals must ensure that the movement of ash tree materials and firewood of all tree species be completed in accordance with federal *Plant Protection Act*, 2000 and with the written consent of the Canadian Food Inspection Agency (CFIA), as necessary. All trees and shrubs removed from work areas during vegetation clearing activities shall be shredded on site and used as mulch on newly exposed surfaces.
328. All stockpile locations, areas, heights, and storage volumes will be identified in the EMP and accepted by relevant authorities.
329. Uncontaminated topsoil to be removed as part of site clearing will be stockpiled and re-used for on-site landscaping.
330. Where topsoil is stockpiled greater than 1.3 m or longer than 6 months, the soil shall be amended with compost to re-establish healthy soil structure and restore soil organism populations.
331. As required, soil will be de-compact as per PCA's ESG Document ESG-1-Post. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

The following general mitigation measures will be employed to eliminate, alleviate or avoid potentially adverse effects to vegetation:

332. Where required, appropriate municipal permits for tree removal will be obtained.
333. Work activities will be confined to planned areas and within previously disturbed areas.
334. Where practical, branches of the large trees will be trimmed back as opposed to undertaking tree removal.
335. Disturbance of vegetation along the shoreline must be limited to what is required for allowing reasonable completion of the Project with minimal environmental impact; if necessary, riparian vegetation will be removed last and kept to a minimum.
336. Vegetation removal will be phased to reflect construction activity.



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337. Local soil will be stockpiled and re-used as opposed to bringing in soil from other locales unless there are invasive species issues that dictate otherwise.
338. Stabilize the ground surface at all disturbed areas.
339. The Project Location will be reinstated to ensure re-planting success.
340. Native grasses, shrubs, etc. will be planted to match current conditions to the extent possible, in accordance with the reinstatement and restoration plan (see Appendix B of this DIA).
341. In case of drought, maintained trees and vegetation will be irrigated.
342. All planted vegetation will be guaranteed to last at least one season following planting (nursery stock comes with a 1-year warranty)
343. Seeds purchased commercially will comply with the following:
  - Weed seed content: No invasive plants will be present (only certified weed-free will be used) and;
  - Germination of the desired seed: Germination generally must not be less than 50% for most species, although some shrubs and forbs will have lower percentages
344. A detailed monitoring plan has been developed with duration triggers and contingency measures to ensure recolonization of the aquatic vegetation and by association the PSW is achieved (See Section 8).

#### **4.21 Invasive Species**

345. Conduct all work activities in accordance with the EMP will be produced including best management practice fact sheets. For a complete list of invasive plant species reported in the Project Location refer to Section 3.3.1. in the DIA
346. Conduct a site assessment for invasive plant infestations prior to Project commencement and familiarize workers with invasive species potentially present in the area, targeting the species that have been recently reported in the region.
347. For all invasive species encounters (or suspected encounters), submit a photo(s) and report of the specimen to PCA for confirmation and submission to the Invading Species Hotline (1-800-563-7711) or online at EDDMaps Ontario, <https://www.eddmaps.org/ontario/>.

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348. There is the potential that Water Chestnut could pass through/around the construction site. Equipment shall be inspected and cleaned of all loose soil and vegetation prior to arrival on Location and before leaving an area of infestation. An inspection checklist shall be included in the EMP and accepted by the relevant authority.

- Should a specimen(s) be discovered, the GPS location, depth and size of the specimen will be recorded. Should there be multiple specimens, the number of specimens, average size of specimen, and approximate size of the cluster will also be recorded. The physical state of the specimen(s) will be documented (i.e. embedded and growing in substrate, floating individually, floating as part of mat, etc.).
- If possible, workers will attempt to collect and remove specimen(s). Removal of specimens will be accomplished by hand, at the direction of the relevant authorities. Harvested specimens will be stored on the boat during removal, and then transferred to biodegradable bags and disposed of at designated waste disposal facilities.

349. Round Goby (*Neogobius melanostomus*) or other invasive species found during Construction Water Management activities shall be first anesthetized using clove oil and then euthanized humanely and not returned to the water system, this shall be reported to PCA.

350. Procedures, checklists and diagrams related to vehicles, vessels, and equipment used in water will be conducted in accordance with PCA's Vehicle and Equipment Washing and Cleaning guideline (ESG-16-C). Ballasts of all in-water vessels will be purged prior to coming on site, should they originate from outside the Great Lakes system, so that aquatic organisms and pathogens are removed or rendered harmless before the ballast water is released into a new location. Proof that this mitigation was applied may be requested before equipment is permitted into the protected heritage place. Deviations from specific requirements will be provided in the EMP and approved by relevant authorities.

351. Any equipment or vehicles which are to be used in water will be thoroughly cleaned of any visible mud, vegetation, mussels, etc. before and after use.

- Vessels/equipment will be drained of standing water.
- Vessels/equipment will be cleaned with hot water (>50°C) at high pressure water (>250 psi).

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- Vessels/equipment will be dried for 2-7 days in sunlight before transported between waterbodies.
  - Cleaning of vessels/equipment will be conducted away from waterbodies at a recommended distance of at least 30 m from the shoreline.
352. Work attire, boots, and other personal protection equipment will be cleaned prior to entering the work site, and prior to leaving the work site in accordance with the Ontario Invasive Plant Council's "Clean Equipment Protocol".
353. Proponents shall certify that all construction material sources used for supplies of sand, gravel, rock and mulch are weed-free prior to obtaining or transporting any material from them. Obtain and use only certified weed-free straw or use fiber roll logs for sediment containment. Hay shall not be used as it contains seed heads and seeds from agricultural fields (often weedy / invasive species).
354. Soils where invasive species are present will not be reused or left on the Project Location but disposed of off site at a licensed facility.
355. Use weed-free seed and confirm that seed mix to be used for re-vegetation purposes does not (potentially) contain invasive plants.
356. Move only weed / contaminate-free materials into non-infested areas. Moving materials from one infested location to another within a particular zone may not cause contamination but moving materials from infested to non-infested areas could lead to the introduction and spread of invasive plants.
357. Moving material from the construction site to any part of the protected heritage place unless must be approved by the designated Parks Canada staff.
358. If removal of invasive species occurs, individuals will be disposed of appropriately, off site to ensure no further propagation.
359. Should an invasive species be discovered and not identified, a photo, location and report of the specimen will be sent to the relevant authority.

#### **4.22 Archaeological and Cultural Heritage Resources**

360. Terrestrial archaeology associated with this Project is located in areas outside of the jurisdiction of the Federal Authorities. Work activities in proximity to these areas is subject to permits from the relevant Authorities.

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361. Representatives of interested Indigenous communities will be invited to attend on-site investigations as monitors.
362. In the case of conflict between permits from the relevant authority and these mitigation measures, the proponent shall facilitate a meeting to resolve the conflict.
363. Conduct all work activities in accordance with the Project's Heritage and Archaeological Resources Plan.
364. Before any on-site mobilization / construction work commences, the proponent will clearly delineate any archaeologically sensitive areas and photo-document this activity for the relevant authorities' records. These areas will be deemed no-go zones for staging, vehicular traffic and machinery. Avoid known potential cultural resources and archaeological sites.
365. Should construction impacts extend beyond the area assessed in this report, further archaeological assessment of those areas should precede any construction activity.
366. Ensure that on-site workers receive appropriate cultural resource awareness training.
367. In the event that previously unidentified archaeological or cultural heritage resources are found by activities associated with the preliminary design phase of the Third Crossing of the Cataraqui River Project the following steps were recommended by Golder (2017):
- Immediately cease work in the area of the discovery.
  - Do not disturb the discoveries further and secure them as needed with fencing, tarps, or other appropriate methods.
  - Inform Project managers and site supervisors.
  - The Project manager must contact the relevant authorities as well as the Project archaeologist or cultural heritage specialist (depending on the type of cultural heritage resource discovered) contracted for the Project to conduct a site visit and provide expert advice.
  - The archaeologist or cultural heritage specialist will help determine the need to contact affected communities or interested parties and determine if further

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archaeological assessment or cultural heritage assessment and mitigation will be necessary.

- If the accidental discovery was made during an emergency operation such as the cleanup of a toxic spill, determine with the relevant Authority when it is safe for an archaeologist or cultural heritage specialist may access the site. Work with archaeology to develop a situation-specific safe work practice.
- Apply any mitigation measures that may have been previously identified by archaeologist or cultural resource advisor for the immediate area of work.
- Ensure that all exposed underwater cultural materials are kept submerged and/or wet while waiting for direction.

368. If the unexpected discovery includes human remains the following steps are recommended:

- Immediately cease work in the area of the discovery and inform the site supervisor.
- The site supervisor must contact the Kingston Police department and Project managers.
- The Office of the Coroner must be contacted.
- If the remains are identified as coming from an archaeological context the Project archaeologist and Registrar of Cemeteries will need to be consulted.
- The Project archaeologist, Kingston Police and coroner will advise on further action.
- The Cemeteries Act R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 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.
- Should excavations unearth bones, remains or other such evidence of an Indigenous burial site or any archaeological findings, the Proponent will notify the nearest First Nation Government (or other community of Indigenous people who are willing to act as a representative and whose members have a close cultural affinity to the interred person) with an invitation to attend and assist in establishing a protocol for appropriate handling of the remains or associated artifacts, prior to removal.

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369. Appendix D contains the Cultural Heritage Protection and Enhancement Plan prepared by Golder (2017) which has been prepared to prevent or minimize adverse effects to cultural heritage which may arise during the various phases of the Project. Guidance for the development of the Plan is drawn from the Canada's Historic Places Standards and Guidelines, and the MTCS's Ontario Heritage Tool Kit Heritage Resources in the Land Use Planning Process and Eight Guiding Principles in the Conservation of Built Heritage Properties (2008). The following sections provide a summary of the Cultural Heritage Protection Plan, as it relates to the potential for adverse effects to the 80 Gore Road Property; Archaeological Site BbGc-127 and the Survey Marker.

#### **4.22.1 80 Gore Road Property**

According to Golder (2017), the property's heritage designation under Part IV the Ontario Heritage Act protects the whole property at 80 Gore Road. Minimal intervention on cultural heritage resources is the best option where developments occur on or adjacent to known cultural heritage resources. Minimal impacts to the heritage values of 80 Gore Road can be by achieved by avoiding as many heritage attributes of the property as possible and developing plans to preserve, rehabilitate and restore heritage attributes of the property as required. The following mitigation measures are proposed to reduce this potentially adverse effect:

- 370. Design Gore Road and the approaches to the bridge so that as little of the dry-stone wall on 80 Gore Road as possible is affected.
- 371. Design Gore Road and the bridge approaches as close to the south side of the Gore Road right-of-way as possible.
- 372. Design the lanes, medians, right-of-way's and/or ditches of the new Gore Road as narrow as possible without impacting safety, accessibility, or traffic capacity.
- 373. Document the dry-stone wall in its current condition by a qualified heritage stone mason or heritage recorder. A qualified heritage stonemason may need to conduct a technical.
- 374. Documentation of the wall prior to reconstruction.
- 375. Assess/inventory flora along the southern boundary of 80 Gore Road that will need to be removed for road widening or bridge construction activities and identify healthy specimens that may be associated with historic agricultural

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activities (orchard) and formal gardens (non-native heritage species) that could be moved to another part of 80 Gore Road if feasible.

376. Develop a preliminary interpretive plan to provide enhanced opportunities for visitor experience and built the interpretive plan for the bridge into the landscape plan regarding placement of potential interpretive panels/elements.
377. Develop a plan to protect Hawthorn Cottage and the dry-stone wall from direct impact from vehicles travelling on Gore Road, wooden bollards that are sympathetic to the heritage values of the property and/or a vegetation screen on the south boundary of 80 Gore Road may be appropriate. Bollards or vegetative screening will need to be built into the landscape plan for the property.
378. Document the condition of Hawthorn Cottage in advance of any construction activities.
379. Detailed photo-documentation or laser scanning are two possible methods of documenting the structure.
380. Document the condition of the dry-stone wall in advance of any construction activities by a qualified heritage stonemason.
381. Sections of the wall have been poorly rebuilt or repaired in the past, the stonemason must evaluate these sections for possible stabilization or repair and restoration if needed.
382. Develop a monitoring plan to watch for potential damage to Hawthorn Cottage and the dry-stone wall based on the documentation and monitor the Cottage and Dry-Stone Wall for damage.
383. Rebuild the section of Dry-Stone Wall that will be reconstructed after road reconstruction is complete to prevent potential damage during construction activities.
384. For reconstruction of the section of dry-stone wall that must be removed for Gore Road improvements:
385. Reconstruction must be done by a qualified heritage stone mason.
386. Reconstruction must replicate the current walls construction. However, the reconstructed section of wall must be clearly identifiable as a reconstruction on close examination.

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387. Reconstruction could turn the wall approximately 90 degrees from the existing/remaining dry stone wall to run parallel to Gore Road towards Kingston Road 15. During consultation for the CHIA in 2011 with the Kingston Heritage Advisory Committee, the committee indicated a preference for this approach.

#### **4.22.2 Archaeological Site BbGc-127**

388. A barrier will be installed to avoid this archaeological site which will be monitored during construction phases of the Project.

#### **4.22.3 Survey Marker**

389. Options to mitigate the potential for adverse effects to this resource have been proposed by Golder 2017. These include preservation in situ; or, legally document its position, temporarily relocate it, and then replace it to its original location after construction.

390. According to Section 443 (2) of the Criminal Code, a land surveyor, may move a survey marker during the course of work if it is carefully documented beforehand and replaced after the work is finished; It is the intention of the Proponent to preserve the Survey Marker in situ, with temporary relocation remaining as an option.

391. If it is impossible to replace the survey marker the surveyor must establish a permanent record of the original position sufficient so that the original position of the marker can be ascertained in the future if necessary.

#### **4.22.4 Underwater Archaeology**

392. Random monitoring carried out by a professional archaeologist, of excavated materials during the site-preparation and construction phase, of the proposed bridge must be conducted to ensure that no archaeological resources are being impacted.

393. Should previously undocumented archaeological resources be discovered, they may be an archaeological site. All construction or any other activity that may potentially impact the resource and surrounding area, must cease immediately until such time that the resource has been properly evaluated by the City of Kingston, the Project archaeologist and PCA.



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#### **4.23 Visitor Experience, Recreational Opportunities and Navigation**

394. Project activities will need to be implemented in a manner that minimizes disruption to community character / aesthetics, business activity, and use and enjoyment of property by the public.
395. Immediately following Project completion, or earlier if feasible, revegetate the site as per the Project's Site Restoration Plan and the guidelines for Revegetation in PCA's ESG Document ESG-1-Post.
396. Following approval by the responsible authorities, implement a Traffic Management Plan for road vehicles.
397. Safety measures as per specifications will be implemented prior to construction and maintained or changed following Project completion.
398. Make use of engineering controls to modify equipment / machinery or the work area to reduce noise disturbance (e.g., substitute existing equipment with quieter equipment; retro-fit existing equipment with damping materials, mufflers, or enclosures; erect barriers; maintain equipment; etc.).
399. Adhere to load restrictions consistent with City Road constraints for construction material delivery.
400. Minimize Project duration and in-water footprint to the extent possible. And do not exceed maximum footprints in design drawings
401. Monitor and mitigate complaints by keeping a record of complaints and addressing any issues raised. Any complaints related to navigation will be provided to TC.
402. If necessary, temporary closure of public access to the Project Location including installation of temporary signage and safety warnings.
403. Develop and maintain a website as well as a dedicated telephone 'hotline' to provide Project information and to record (and respond to) public complaints.
404. Close and mark the work site with appropriate signage while active construction, repair or maintenance is underway; consider temporary detours or reroutes as appropriate.
405. Secure and clearly mark unattended safety hazards (e.g., excavations, debris piles) with fencing, warning signs, area closures or combination thereof.

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406. If closing the area is not possible, maintain a safe working distance between work activities and visitors. If traffic control is required, a flag person must manage traffic through the construction/hazard area.
407. Visitor access trails and roads outside the construction area must be free of construction materials, waste, machinery and equipment.
408. Notify the public in advance of specific on-land and in-water work activities that could involve associated temporary obstructions and/or detour requirements.
409. Workers will adhere to prescribed public safety procedures.
410. The navigable channel is to remain open, and the navigation channel span installation in particular will occur when the lock stations are closed to watercraft.
411. Crew boats will be used to direct the public away from in-water work limits.
412. No loads will be lifted over boats passing through the navigational channel.
413. Construction activities adjacent to the navigational channel will follow procedures to ensure equipment (such as barges and crane booms) and materials (being moved by crane, barge, or otherwise) are not positioned in the navigational channel required clearance.
414. Any material lifting over the navigational channel is preferred to occur Outside of the PCA Navigation Period. If material lifting over the navigational channel is required during the PCA Navigation Period (during operating hours) or at any time there is a vessel present in the waterway, a material lifting procedure will be utilized to ensure marine vessel safety is maintained at all times. Lift planning will ensure that no equipment or material enters the navigation envelope. Lift planning could include monitoring for marine vessels north and south of the Project Location during the PCA Navigation Period (during operating hours) or at any time there is a vessel present in the waterway; scheduling work activities to occur during the PCA Navigation Period (outside of operating hours). Material lifting procedures occurring over the navigation channel and during the PCA Navigation Period (during operating hours) or at any time there is a vessel present in the waterway will be included in the EMP and approved by PCA and TC.
415. Construction of the marine access located within the navigational channel (trestle lift span) is scheduled outside of the PCA Navigation Period to avoid interference with marine traffic to the extent possible. Review and acceptance

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(possible approval) by TC will be required if any changes are proposed. The trestle lift span is primarily planned to be used for movement of construction equipment and materials. The design of the trestle lift span incorporates a secondary positive stop to prevent accidental lowering, similar to permanent lift spans.

416. The trestle lift span will remain lowered Outside of the PCA Navigation Period to facilitate construction activities. During the PCA Navigation Period (during operating hours), the trestle lift span will primarily be raised above elevation 82.4 (75.7 plus required 6.7m vertical clearance) to avoid interference with marine traffic to the extent possible. To facilitate construction activities, the trestle lift span will be lowered for use occasionally, following a PCA Navigation Period (during operating hours) lift span operating procedure incorporated in an EMP and approved by PCA and TC, to avoid interference with marine traffic.
417. Barges are anticipated to be utilized to ferry equipment and material across the navigation channel to enable the navigation channel to remain open during the PCA Navigation Period , and to permit equipment and material movement from the east to the west side of the Project. A barge movement plan will be incorporated in an EMP and approved by PCA and TC, ensuring there are no impacts to navigation and ensuring boater safety.
418. Based on the proposed realignment of the navigation channel, a navigational channel clearance of 15 m horizontally and 6.7 m vertically is required based upon the Lake Ontario high water datum of 75.7 masl as used at the Highway 401 bridge. The bathymetry to perform this realignment, coordination of navigation chart changes with TC, and carrying-out any changes required to the aids to navigation will be confirmed. The Proponent will advise Canadian Hydrographic Services of any changes that are required on the nautical charts for the area.
419. Navigational lighting will be temporarily provided on the access trestle over the navigation channel.

## **4.24 Operation and Maintenance**

### **4.24.1 Snow Removal**

420. Pre-treatment of the bridge deck will be undertaken with a direct liquid application of multi-chloride brine in advance of a winter event as required.

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- 421. The bridge deck will be designed to allow efficient snow removal from both the road and multiuse path.
- 422. The bridge deck will be sloped towards drains at the concrete barrier between the road and the multi-use pathway to direct snowmelt to the onshore stormwater management facilities.
- 423. Snow on the multi-use pathway may also be removed by blowing over the barrier into trucks for removal off the bridge.

#### 4.24.2 Noise

During operation, the following mitigation measures for noise have been developed:

- 424. Implement sound barriers per the preferred landscape design to achieve the required 5 dB reduction in traffic noise levels resulting from the operation phase.
- 425. The extent of sound barriers, including location, length, height and type have been confirmed as follows:
  - 426. As shown on Figure 4.2 of Appendix B, the anticipated use of sound barriers for the identified NSA on the west side lands includes:
    - 427. Barrier NBRW01 (River Park Subdivision West): a 2.3 m high by 113 m long sound barrier wall, earthen berm or a combination would be required on the north side of John Counter Boulevard up to Ascot Lane.
    - 428. Barrier NBRW02 (River Park Subdivision East): a 2.3 m high by 96 m long sound barrier wall, earthen berm or a combination would be needed on the north side of John Counter Boulevard up to Ascot Lane.
  - 429. As shown in Figure 4.2 of Appendix B, the anticipated use of sound barriers for the identified NSA on the east side lands includes:
    - 430. Barrier NBRE09-1 and NBRE07 (Kenwood Circle Residential): a 3.0 m high 167 m long sound barrier wall would be required on the retaining wall leading up to the bridge. On the west side of the Point St Mark Drive, south of Gore Road, a 2.3m high 31 m long sound barrier would be required.
    - 431. Barrier NBRE03 (Barker Drive Residential): a 2.3 m high by 178 m long sound barrier wall would be needed, extending east from the south side of the Point St. Mark Drive / Gore Road intersection to Highway 15.

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432. Generally, the sound barriers are limited to either within or along the boundary of the rights-of-way with limited return legs extending roughly perpendicular to the main lengths of the sound barriers beyond the right-of-way.

#### **4.24.3 Navigation**

433. Provisions will be in place to accommodate navigational lighting on the north- and-south-facing sides of the permanent bridge deck, directly above the navigation channel. This lighting must also be designed so as to minimize impacts to the wetland.

#### **4.24.4 Stormwater Management**

434. The high point of the bridge will be approximately the center of the navigation channel span, which allows stormwater to drain from the center of the arch to stormwater management facilities on-land.

435. The following drainage pipes are required, which will be located underneath the bridge deck, and extend through the expansion joints to connect to the stormwater management system on-land via sleeves through the abutment walls:

- Draining to the west approach, one pipe with diameter varying from 300 mm to 600 mm to collect the stormwater from the vehicular lanes, shoulder and multi-use pathway.
- Draining to the east approach, one 300 mm diameter pipe to collect the stormwater from the vehicular lanes, shoulder and multi-use pathway.

#### **4.24.5 Contaminants Management**

436. During operation, day to day spills or deleterious substance deposition on the bridge deck will be directed to the storm water drainage system, conveyed on land in the storm water management ponds.