

Table 1: Identification of Environmental Effects and Proposed Mitigation Measures

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
Air Quality	<p>Site Preparation, Excavation and Demobilization: Potential for air emissions from construction vehicles, machinery and equipment to degrade local air quality.</p>	<ul style="list-style-type: none"> • Maintain vehicles, machinery and equipment in good repair, equipped with emission controls, as applicable, and operate them within regulatory requirements. • Comply with operating specifications for heavy equipment and machinery. • Minimize operation and idling of gas-powered equipment and vehicles, in particular, during smog advisories. • No burning of waste or excess materials is permitted. 	<p>Low emissions from Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p>	-1	No
	<p>Site Preparation and Excavation: Potential impact to air quality and human health due to release of dust, soil and airborne particles.</p>	<ul style="list-style-type: none"> • Suppress releases of dust using water mist or other appropriate methods of control during site preparation, excavation, and loading and unloading of materials. • Soils will only be transported in secure holdings to limit loss of contaminated soils as dust. • Use controlled work procedures in order to eliminate release of dust from construction works including: <ul style="list-style-type: none"> ○ Stabilize areas of stockpiled or exposed soils using tarps or other similar covers; and ○ Avoid activities with potential to release airborne particulates during windy and prolonged dry periods. • Workers to wear protective gear (e.g., safety work boots, respirators, hard hats, etc.) in accordance with the <i>Occupational Health and Safety Act (OHS Act)</i> and regulations. • Work shall be carried out in compliance with the Canadian <i>Environmental Protection Act (CEPA)</i>, and applicable air emission regulations and by-laws. 	<p>Low potential for fugitive dust during Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p>	-1	No
	<p>Tank system upgrades: Potential for venting of tanks to degrade air quality.</p>	<ul style="list-style-type: none"> • Tank venting will be conducted according to applicable regulations. 	<p>Low potential for residual effect if regulations followed.</p>	-1	No

<p>Noise</p>	<p>Site Preparation and Excavation: Temporary disturbance to terrestrial biota from noise generated by site preparation and excavation activities (machinery, human presence).</p>	<ul style="list-style-type: none"> • The regulatory limit for operating machinery will be in accordance with the local noise bylaws. • Where applicable, appropriate ear protection equipment must be worn by all employees working on site. • Install noise mufflers on construction machinery to reduce noise levels. • Contractors should avoid excess and unnecessary noise. • All Project works will be conducted outside the critical nesting period for migratory and colonial waterbirds (see Section for Birds). 	<p>Low potential for residual effect as generation of noise will be temporary.</p>	<p>-1</p>	<p>No</p>
--------------	---	--	--	-----------	-----------

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
Surficial Geology and Soil	Site Preparation and Excavation: Site clearing and excavations will result in temporary exposure of some portions of the Project site to wind and surface run-off.	<ul style="list-style-type: none"> Stabilize soil after excavation to prevent its erosion and transport. Develop and implement an erosion control plan. To minimize land disturbance, the excavation envelope should be clearly demarcated and kept as small as possible. Undertake earthworks using construction techniques designed to prevent sedimentation. Restore and re-vegetate disturbed areas as soon as possible to minimize the duration of soil exposure. 	Low potential for residual effect if mitigation measures applied.	-1	No
	Excavation: Contaminated soils removal.	<ul style="list-style-type: none"> Contaminated soils will be characterized against CCME criteria and follow appropriate management strategies. In areas where soils require removal from cracks and crevices in the bedrock, use a high-pressure high efficiency particulate air (HEPA) vacuum unit to remove contaminated soils. Any uncontaminated topsoil removed as part of site clearing should be stockpiled and re-used for on-site restoration. 	Low potential for residual effect if mitigation measures applied.	-1	No
	Site Preparation, Excavation and Demobilization: Potential for leak or spill of petroleum products and other deleterious substances from vehicles and machinery to contaminate the soil.	<ul style="list-style-type: none"> Ensure that absorbent materials are available on-site in the event that a spill of deleterious substances should occur. All spills and leaks of deleterious substances must be immediately contained and cleaned up in accordance with Provincial regulatory requirements and reported immediately to the Ontario Spills Action Centre (1-800-268-6060). Maintain a logbook detailing any such measures. Apply elements of Spill Response Plan: Accidents and Malfunctions. 	Low potential for residual effect if mitigation measures applied.	-1	No

Appendix 3: General Soil Remediation and Tank Upgrade Mitigation

Fisheries and Oceans Canada

	<p>Tank system upgrades: Potential for leak or spill of Petroleum products and other deleterious substances from ASTs causing contamination of soil during upgrades of fuel system.</p>	<ul style="list-style-type: none"> • Tanks to meet all regulatory requirements (e.g. Federal Storage Tank Systems for Petroleum Products and allied Petroleum Products Regulations; Canadian Council of Ministers of the Environment; National Fire Code of Canada; including features such as double-walled, overflow prevention, venting, tank supports etc.) • If temporary on-site storage of the AST, associated piping, or contaminated soil is required, it will be contained and stored in impermeable containers or a polyethylene liner. 	Low potential for residual effect if mitigation measures applied.	-1	No
Vegetation	<p>Site Preparation: Loss of existing vegetation and associated wildlife habitat as a result of proposed Project activities.</p>	<ul style="list-style-type: none"> • Minimize as much as possible any disturbance to existing vegetation. • The footprints for the excavation will be landscaped to match existing condition. The landscaping plan will include site grading, soil reinstatement and planting/seeding plans. • Vegetation will be restored upon completion of excavation and tank removals, using native species typical of the locality and soils. • Any seeding should commence as soon as possible, in conjunction with planting works. 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. • Topsoil shall be placed to a maximum of 30 mm depth over disturbed bedrock to match pre-excavation soil depths at the site. 	<p>Minor loss of vegetated area due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p>	-1	No

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
	<p>Site Preparation and Excavation: Potential for contamination.</p>	<ul style="list-style-type: none"> • Ensure hazardous substances, if required, are stored, handled and applied in accordance with local regulations and in a manner which prevents re-release into the environment. • Any hazardous substances stored within the stockpile areas will be properly contained to prevent its re-release into the environment. • Ensure a contingency plan is developed and implemented in the event of an accidental spill from construction vehicle, machinery or equipment. 	<p>Low potential for residual effect if mitigation measures applied.</p>	<p>-1</p>	<p>No</p>
<p>Mammals</p>	<p>Site Preparation and Excavation: Temporary habitat loss and potential accidental mortality due to Project activities.</p>	<ul style="list-style-type: none"> • Minimize as much as possible any disturbance to vegetation on-site which serves as potential mammal habitat. • Restore vegetation upon completion of excavation, as per mitigation measures provided in Vegetation section above. 	<p>Temporary and minor loss of habitat due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p>	<p>-1</p>	<p>No</p>

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
Birds	<p>Site Preparation and Excavation: Temporary habitat loss and potential accidental mortality due to Project activities.</p>	<ul style="list-style-type: none"> Minimize as much as possible any disturbance to on-site vegetation. Mitigation measures presented within this table and those outlined in the PWGSC specification document for project R.059427.001 is also applicable for Species, Populations, Communities and Habitats. Implementation of the mitigation measures will ensure compliance with the Migratory Birds Convention Act (MBCA). If a nest is found during vegetation clearing activities, the nest site and neighboring vegetation will be left undisturbed until nesting is completed. Construction activities will also be minimized in the immediate area until nesting is completed. Apply mitigation measures as per "Species at Risk listed under SARA/ESA" and "Vegetation" VECs. 	<p>Temporary and minor loss of habitat due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p>	-1	No
Amphibians and Reptiles	<p>Site Preparation and Excavation: Temporary habitat loss and potential accidental mortality due to Project activities.</p>	<ul style="list-style-type: none"> Minimize as much as possible any disturbance to on-site vegetation. Conduct field survey prior to site preparation and excavation activities to determine the presence of potential reptile hibernacula sites within Project footprint. Surveys should be conducted during the optimal time to detect reptiles emerging from hibernation (April). Construct silt fencing to keep amphibian and reptiles out of Project footprint. Avoid use of silt fencing with nylon mesh netting reinforcing the regular, woven plastic strand material. Large-bodied snakes become entangled in this mesh and perish. Apply mitigation measures as per "Species at Risk listed under SARA/ESA" and "Vegetation" VECs. 	<p>Minor loss of habitat due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p>	-1	No
Species at Risk listed under SARA/ESA	<p>Site Preparation and Excavation: Habitat loss and potential accidental mortality of the species due to</p>	<ul style="list-style-type: none"> Construct silt fencing to keep SARA/ESA species out of Project footprint. Avoid use of silt fencing with nylon mesh netting reinforcing the regular, woven plastic strand material. Large-bodied snakes become entangled in this mesh and perish. 	<p>Low potential for residual effect if mitigation measures applied.</p>	-1	No

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
	Project activities.	<ul style="list-style-type: none"> • Contractors will review Species at Risk list (Appendix A) and website information prior to arriving on site. • All contractors will be made aware that these species and their habitats are protected. • Contractors must ensure that equipment does not destroy vegetation on the site. • Equipment and personnel will travel on established paths and roadways while on site. • Should a Species at Risk be encountered at any time during the project, measures are to be implemented to avoid destruction, injury, or interference with the species, its residence and/or its habitat (e.g. through siting, timing, or design changes). If the foregoing cannot be avoided, work should cease and the Project Manager should contact DFO and PWGSC Environmental Services who will consult with Environment Canada for advice regarding mitigation measures. 			
Surface Water	<p>Site Preparation, Excavation and Demobilization: Potential for leaks or spills of fuel, sediment, soil or other hazardous substances to be released into surface water during Project activities.</p>	<ul style="list-style-type: none"> • An erosion control plan should be developed to mitigate potential effects on water quality with respect to the transport and movement of remediation equipment and contaminated sediments and remediation soils. • Appropriate measures should be adopted to minimize any impacts of accidental spills during transport, staging and maintenance activities. • Transportation of the contaminated soil via barges to the mainland will be properly contained and secured so that wind does not blow contaminated soil particles into the water. Transportation across the water during storms with heavy rainfall or high winds should be avoided to minimize risk. • Ensure that hazardous substances (including fuel) are handled and applied in a manner to prevent release into the environment. All deleterious substances should be stored at least 30 m from the water. In the scenario that a barge and ramp are used for transport of equipment and sediment/soils, deleterious substances must be transported in appropriate containers and be properly secured at all times. 	Low potential for residual effect if mitigation measures applied	-1	No

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
		<ul style="list-style-type: none"> • Construction machinery and equipment (including ramping structures) are to arrive on-site in a clean condition and be maintained free of fluid leaks. • Any washing, refueling or servicing to construction equipment in use is to take place a minimum of 30 m from open surface waters (ex. lake shores) and within a flat, impermeable stable surface to prevent any deleterious substances from entering the water. • Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads a minimum of 30 m from water. • Stockpiled material will be stored a safe distance from all surface water to ensure that no deleterious substances enter surface waters. • Excavated soils will only be transported in secured units to ensure no loss to the environment. • A spill response kit to be on site in the event of a spill. Immediately contain and clean up any spills in accordance with provincial regulatory requirements. Report spill to the Ontario Spills Action Centre (1-800-268-6060). • Apply elements of Spill Response Plan as outlined in Table 3-2: Accidents and Malfunctions. • Apply Mitigation Measures under Fish/Fish Habitat VEC/VSC as per Water quality impairments (sediment loading; fuels and lubricants from machinery). • Keep all materials securely locked up to avoid vandalism and accidental spills. 			

<p>Site Preparation, Excavation and Demobilization: Potential for the release of deleterious substances, sediment and soil into the surface water during ground disturbance and precipitation events.</p>	<ul style="list-style-type: none"> • Site remediation should be completed at a time of year (e.g., during periods of dry weather) that will minimize the potential for sediment, debris and/or other contaminants to enter the lake. • An erosion control plan should be developed to mitigate potential effects on water quality with respect to the transport and movement of remediation equipment and contaminated sediments • Control disposal of runoff of water containing harmful substances through the use of silt screens or other methods. • Runoff water from the excavation, soil stockpile area, and decontamination pad will be collected, analyzed, and disposed of 	<p>Low potential for residual effect if mitigation measures applied</p>	<p>-1</p>	<p>No</p>
--	--	---	-----------	-----------

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
		according to applicable regulations. <ul style="list-style-type: none"> • A spill response kit to be on site in the event of a spill. Immediately contain and clean up any spills in accordance with provincial regulatory requirements. Report spill to the Ontario Spills Action Centre (1-800-268-6060) Apply elements of Spill Response Plan: Accidents and Malfunctions. 			
	Tank system upgrades: Potential for leak or spill of Petroleum products and other deleterious substances from ASTs causing contamination of water during upgrades of fuel system.	<ul style="list-style-type: none"> • Work activities will be limited to the vicinity of the ASTs. • If a spill occurs, immediate steps should be implemented for containment and recovery of spilled product and other contaminated media. • If temporary on-site storage of the AST, associated piping, or contaminated soil is required, it will be contained and stored in impermeable containers or a polyethylene liner as far from the shoreline as possible. 	Low potential for residual effect if mitigation measures applied	-1	No

<p>Fish and Fish Habitat</p>	<p>Demobilization: Water quality impairments (sediment loading; fuels and lubricants from machinery).</p>	<ul style="list-style-type: none"> • Sediment and erosion control measures will be installed and will be maintained during the work phase, and until the site has been stabilized. • Control measures should be inspected daily to ensure they are functioning and are maintained as required. If the control measures are not functioning properly, no further work will occur until the problem is resolved. • Any washing, refuelling or servicing to construction equipment in use on the island is to take place a minimum of 30 m from the lake shore (cobble beach) and within a flat, impermeable stable surface to prevent any deleterious substances from entering the water. • All materials and equipment used will be operated and stored in a manner that prevents any deleterious substances from entering the water. • Store and stabilize stockpiled materials, including any hazardous materials such as fuels and lubricants, a minimum of 30 m away from any surface waters. • Ensure equipment entering the water is free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the river. • Establish spill management techniques prior to commencement of work. • Keep an emergency spill kit on site in case of fluid leaks or spills from machinery into the surface waters. 	<p>Low potential for residual effect if mitigation measures applied</p>	<p>-1</p>	<p>No</p>
------------------------------	--	--	---	-----------	-----------

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
Aesthetics	Site Preparation, Excavation and Demobilization: Temporary visual disruption of aesthetic appearance	<ul style="list-style-type: none"> Minimize period of disturbance. Grounds to be restored promptly upon construction completion to meet DFO use objectives. 	Low potential for residual effect if mitigation measures applied.	-1	No
Land Use	Site Preparation, Excavation and Demobilization: Potential disturbance to surrounding lands.	<ul style="list-style-type: none"> Maintain temporary fencing for the duration of the Project to ensure contractors do not trespass on private properties, unless a land use agreement has been prepared between DFO. Provide security guard on-site when the workers have left for the day (if necessary). 	Low potential for residual effect if mitigation measures applied.	-1	No
Cultural Resources	Site Preparation, Excavation and Demobilization: Potential accidental damage to structures from excavation equipment.	<ul style="list-style-type: none"> Implement and maintain temporary fencing around the structures for the duration of the Project. 	Low potential for residual effect if mitigation measures applied.	-1	No
Archaeology	Site Preparation, Excavation: Potential to uncover of	<ul style="list-style-type: none"> Immediately suspend all work in the vicinity of the discovery, should human remains be found during excavation. Notify the Ontario Provincial Police, or local police, for them to conduct a site 	Low potential for residual effect if mitigation	-1	No

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
	artifacts.	investigation and to contact the district coroner. Also notify the Ministry of Culture at 1-800-461-7629. <ul style="list-style-type: none"> Should other un-recorded cultural heritage values (archaeological or historical features) be identified during the construction, suspend all activities in the vicinity of the discovery and contact DFO and the Ministry of Culture. 	measures applied.		
Human Health and Safety	Site Preparation, Excavation and Demobilization: Potential adverse safety conditions to workers during the Project activities.	<ul style="list-style-type: none"> Workers to wear protective gear (e.g., safety work boots, respirators, hard hats, safety vests, etc.) in accordance with the <i>Occupational Health and Safety Act (OHSA)</i> and regulations. Use adequate safety barriers and signs to provide a safe environment for workers, employees of the site and the public. The contractor will be required to implement a Health and Safety Plan as per the <i>OHSA</i>. Clearly delineate the excavation site. Produce a Health and Safety plan for the project, including the procedures and practices as stated in the <i>OHSA</i>. Adequate safety barriers and signs should be used to provide a safe environment for workers. 	Low potential for residual effect if mitigation measures applied	-1	No
	Tank system upgrades: Potential for injury to workers and the staff during tank decommissioning activities.	<ul style="list-style-type: none"> Meet or exceed the requirements of all applicable federal and/or provincial legislation, regulations and permits. Do not allow ELA researchers or students access to the work area during decommissioning. All work areas and machinery shall be stabilized, made safe and/or secure at the end of each working day to prevent accidents to people and the environment. 	Low potential for residual effect if mitigation measures applied	-1	No

<p>Waste</p>	<p>Excavation: Generation, storage and disposal of wastes during the excavation of the contaminated soil.</p> <p>Tank system upgrades: Potential for Improper on-site storage and off-site disposal of waste which could degrade soils and surface water.</p>	<ul style="list-style-type: none"> • All waste generated will be disposed according to regulations (<i>i.e.</i>, O. Reg. 347, and as amended by Reg. 558). • The contractor is required to submit proof that a licensed waste hauler is transporting the waste to a facility certified to accept the material. A copy of waste disposal/transfer site's Certificate of Approval and a letter verifying that the said disposal/transfer site will accept the waste must be supplied to the proponent prior to removal of waste from site. • Potentially hazardous wastes will be separated from normal waste through segregation of storage areas and proper labeling of containers. All registered waste will be removed from the site by licensed waste contractors and disposed at approved facilities. 	<p>Low potential for residual effect if waste management measures applied</p>	<p>-1</p>	<p>No</p>
--------------	---	--	---	-----------	-----------

Valued Ecosystem / Social Component	Description of Potential Project Interaction with VEC/VSC	Proposed Mitigation Measures & Best Management Practices	Residual Effects	Significance of Residual Effects ¹	Further Study or Follow-up
	Oil products and deleterious substances generated during operation of the tanks.	<ul style="list-style-type: none"> • The Project will implement a solid waste management program for typical debris handling and disposal. • The disposal of designated substances is regulated under the Ontario <i>Environmental Protection Act (EPA)</i>, specifically O. Reg. 347, General – Waste Management (most recently amended by O. Reg. 395/07). 			

¹ Significance of Residual Impacts rated as follows:

0 = None, 1 = Not significant, 2 = Significant, 3 = Unknown, Positive (+), Negative (-).

Table 2: Accidents and Malfunctions

Accident or Malfunction	Description of Effect	Required Mitigation	Likelihood Residual Effects	Significance of Residual Effects ¹	Further Study or Follow Up
Leak or Spill of petroleum and/or other deleterious substances from vehicles and equipment.	Contamination of soils	<ul style="list-style-type: none"> Apply relevant mitigation measures for accidental leaks and spills, as per the 'Surficial Soils and Geology', 'Surface Water' and 'Fish and Fish Habitat' sections provided in Table 1. Protocols for management of hazardous materials (e.g., responsibilities, emission control, safe storage practices, refuelling protocols, spill containment; emergency response, regulatory compliance, accident/incident reporting) should be in place. Ensure spill response plan and clean up materials are available at the site when hazardous materials are being used. Immediately contain and clean up spills in accordance with provincial regulatory requirements. All personnel will be trained to respond to a spill. Report spills to Ontario Spills Action Centre at 1-800-268-6060 and DFO. 	Low	-1 Insignificant due to small magnitude and limited geographical extent, duration and frequency. No residual permanent adverse effect.	No
Accidents that could harm workers	Excavation site could be a safety hazard to workers.	<ul style="list-style-type: none"> Provide adequate safety barriers and signs to protect safety of workers. Reduce worker fall hazards near the excavation site. Maintain safe ingress and egress to work area. Make medical provisions prior to Project's start for prompt medical aid in the event of serious injury. Develop and implement a site specific Health and Safety Plan as per the OSHA. 	Low	-1 Insignificant due to small magnitude and limited geographical extent, duration and frequency. No residual permanent adverse effect	No

¹ Significance of Residual Impacts rated as follows:

0 = None, 1 = Not significant, 2 = Significant, 3 = Unknown, Positive (+), Negative (-).

To be used in conjunction with the mitigation measures outlined in the PWGSC specification document for project R.059427.001.