

Appendix B

Table I. Environmental Effects and Mitigation Measures: General Activities

GENERAL ACTIVITIES		
VECs	Description of Effects	Mitigations
(1) Air Quality: air quality and noise levels.	<ul style="list-style-type: none"> <input type="checkbox"/> Decreased ambient air quality <input type="checkbox"/> Increased ambient noise levels <input type="checkbox"/> Increased levels of CO₂ and other pollutants 	<ul style="list-style-type: none"> <input type="checkbox"/> Unnecessary idling of equipment and vehicles will not be permitted <input type="checkbox"/> Ensure materials being stored/transported are covered with tarps or equivalent material to contain fine particulate matter <input type="checkbox"/> Confine “noise” activities to daytime hours
(2) Land Resources: soils, topography and landscape.	<ul style="list-style-type: none"> <input type="checkbox"/> Soil compaction and rutting <input type="checkbox"/> Slope instability, due to increased spoil exposure and improper excavation and storage <input type="checkbox"/> Soil contamination 	<ul style="list-style-type: none"> <input type="checkbox"/> Restrict vehicular travel and other equipment operation to the construction site and approved access routes. <input type="checkbox"/> Construction materials shall be stored within the delineated confines of the work site. <input type="checkbox"/> Keep site clearing to a minimum to maintain vegetative cover <input type="checkbox"/> Minimize or halt construction traffic during wet conditions when the soil shows signs of ponding or rutting <input type="checkbox"/> Assess site for erosion control requirements and implement control measures as required (<i>i.e. traps, straws, bales, erosion blankets, silt fencing</i>) <input type="checkbox"/> All hazardous materials and wastes will be clearly labelled with WHMIS labels and information and handled as legally required. <input type="checkbox"/> Keep site maintained in a tidy condition, free from the accumulation of waste products, debris, and litter. Construction sites must undergo thorough clean up at project completion. All waste must be disposed of at an appropriate facility. <input type="checkbox"/> Prepare an Emergency Response Plan (<i>i.e. for incidents such as chemical spills, fires, high winds, heavy rainfall and runoff, etc.</i>), ensure site is equipped with appropriate containment/clean-up tools, and that all personnel are trained in their use.
(3) Water Resources: surface water hydrology, surface water quality, aquatic sediments, and groundwater quality and quantity	<ul style="list-style-type: none"> <input type="checkbox"/> Adverse modifications to surface drainage patterns <input type="checkbox"/> Reduced water quality due to increased erosion, sedimentation, transportation of debris and contamination, etc. <input type="checkbox"/> Potential runoff, erosion, sedimentation, and altered drainage. 	<ul style="list-style-type: none"> <input type="checkbox"/> All fuels, oils, lubricants, and other petrochemical products will not be stored within 100 meters of any water body. <input type="checkbox"/> Designate refuelling areas at least 100 m away from any water body. Refuel machinery on impermeable pads or buried liners designed to allow full containment of spills. <input type="checkbox"/> Capture, contain, and clean up spills and leaks immediately. <input type="checkbox"/> Any equipment operating in water bodies must be cleaned prior to entering the water and inspected daily for leaks; never leave equipment in water overnight. <input type="checkbox"/> Halt activity on exposed soil during periods of high rainfall/runoff <input type="checkbox"/> Isolate work area from open water. Sedimentation and erosion control mechanisms shall be installed around work area to prevent sediments from silt from entering watercourse. Periodically inspect and repair, if necessary, these structures. <input type="checkbox"/> Filter/settle out sediment before allowing water to enter any drainage pathway.

<p>(4) Flora and Fauna: aquatic and terrestrial species /population and communities/habitats</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Damage to/and or removal of vegetation <input type="checkbox"/> Introduction of invasive species <input type="checkbox"/> Sensory disturbance causing displacement/habitat avoidance <input type="checkbox"/> Wildlife habituation/attraction to artificial food sources <input type="checkbox"/> Habitat loss/fragmentation <input type="checkbox"/> Decreased wildlife abundance due to direct mortality <input type="checkbox"/> Damage to nests/dens and disruption of associated animals <input type="checkbox"/> Impeded/altered wildlife movement 	<ul style="list-style-type: none"> <input type="checkbox"/> Careful machine operation is required to prevent damage to surrounding vegetation. <input type="checkbox"/> Ensure excavated material does not damage/bury plant material that is to be retained on site/adjacent areas. <input type="checkbox"/> Minimize disturbance/removal of vegetation. Re-establish native vegetation where has been removed/damage and return all project areas to their original form to discourage invasive species from settling. <input type="checkbox"/> All construction equipment/materials will be cleaned prior (<i>i.e. steamed or pressure washed</i>) to entering park to minimize the risk of introducing weeds and invasive species. <input type="checkbox"/> According to wildlife present schedule, high noise level activities and other intrusive construction activities to avoid critical life stages (<i>i.e. breeding, nesting, rearing, migration</i>) <input type="checkbox"/> The breeding season for most birds within the project area occurs between May 1st and August 31st in the Maritimes, and between May 1st and July 15th in Newfoundland; however some species protected under the <i>Migratory Birds Convention Act</i> nest outside these timeframes. Under section 6 of the <i>Migratory Birds Regulations</i>, it is forbidden to disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird or its carcass, skin, nest or egg except under authority of a permit. <input type="checkbox"/> While most bird species construct nests in trees and shrubs, a number of species of birds nest at ground level (e.g. Common Nighthawk, Killdeer), and some species may nest in burrows in stockpiles of soil or the banks of pits (e.g. Bank Swallows) It should be ensured that activities to reduce erosion do not result in hydroseeding of nests. But that alternate measures be taken to reduce potential for erosion and that nests be protected until chicks have fledged and left the area. <input type="checkbox"/> Should active nests or birds caring for pre-fledged chicks be discovered during project activities outside the prime breeding season windows, establishment of vegetated buffer zones around nests, and minimization or activities in the immediate area until nesting is complete and chicks have naturally migrated from the area shall take place <input type="checkbox"/> When working adjacent to undisturbed areas restrict activity to daylight hours as dusk and dawn are critical times for wildlife. <input type="checkbox"/> Survey area for nests/dens prior to clearing. Do not clear any active nests/dens, or relocate nests/dens without a permit. <input type="checkbox"/> If nests containing eggs or young of migratory birds are located or discovered during breeding season, all activities in the nesting area should be halted until nesting is completed. <input type="checkbox"/> Construct and orient fences in a manner that
---	--	--

		<p>reduces impact to wildlife movement.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Minimize site clearing and retain vegetation when possible to reduce habitat loss/fragmentation. <input type="checkbox"/> Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas where wildlife mortality has or is likely to occur. <input type="checkbox"/> Feeding, enticement, or harassment of wildlife is prohibited. <input type="checkbox"/> Toxic materials and any materials, which may pose a hazard to wildlife, must be stored in secured buildings or containers. <input type="checkbox"/> Store food, garbage, and other smelling products in sealed containers. Pack all garbage out from the site daily, unless permanent garbage facilities exist at the site. <input type="checkbox"/> The project shall meet the requirements of the Fish Passage Guidelines of the respective DFO Region in which the work is occurring (See appendix 1 for operational statements) <input type="checkbox"/> Any instream work in fish bearing waters should only occur between June 1st and September 30th of any year. <input type="checkbox"/> Fish passage will be provided at all times. <input type="checkbox"/> Downstream flow shall be maintained during construction. <input type="checkbox"/> Suitable non-erosive materials shall be used, such as rip-rap, in appropriate areas to prevent erosion. <input type="checkbox"/> Sediment and erosion controls should be installed <i>prior</i> to the beginning of construction activities.
<p>(5) Anthropogenic/Human Environment: socioeconomic, public health, and cultural/heritage resources</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Disruption to park visitors, residents, and businesses due to changed noise, air and water quality, and traffic and changed aesthetics <input type="checkbox"/> Injuries to public and workers arising from project activities <input type="checkbox"/> Potential damage to unknown cultural/archaeological resources 	<ul style="list-style-type: none"> <input type="checkbox"/> Evaluate site layout, access routes, and construction activities to minimize their visual impact <input type="checkbox"/> Clearly sign and fence work areas when left unattended to minimize injury or mortality. <input type="checkbox"/> Workers shall wear appropriate protective clothing and gear. <input type="checkbox"/> Archaeological surveys should be conducted prior to construction <input type="checkbox"/> Should previously unknown archaeological resources/cultural artifacts be discovered, immediately cease work, and alert Parks Canada archaeologist.

Table II. Environmental Effects and Mitigation Measures Projects: Site Preparation

SITE PREPARATION		
VECs	Description of Effects	Mitigations
(1) Air Quality: air quality and noise levels.	<input type="checkbox"/> Decreased ambient air quality <input type="checkbox"/> Increased ambient noise levels	<input type="checkbox"/> Avoid site preparation during dusty, dry, windy periods <input type="checkbox"/> Confine “noise” activities to daytime hours
(2) Land Resources: soils, topography and landscape.	<input type="checkbox"/> Changes in slopes, landforms, and landscape <input type="checkbox"/> Soil compaction and rutting <input type="checkbox"/> Slope instability, due to increased spoil exposure and improper excavation and storage <input type="checkbox"/> Soil contamination	<input type="checkbox"/> Assess slope stability (based on slope length/steepness and soil texture/depth). If possible, adjust activities to avoid areas where slopes are ≥ 15 degrees and where soils are shallow and likely to move with disturbance). Stabilize slopes as appropriate for local conditions. <input type="checkbox"/> Clear minimum area necessary. Hand clear steep slopes that do not require grading. Delay clearing slopes until immediately before scheduled construction and reclaim immediately afterwards. <input type="checkbox"/> Implement Sediment /Erosion Control measures when soil is disturbed or exposed <input type="checkbox"/> Dewater all excavations at appropriate locations. Sediment must settle out or be filtered before water is allowed to enter a drainage pathway. <input type="checkbox"/> If contamination is uncovered during excavation, investigate and identify the source, properly remove and dispose of. <input type="checkbox"/> Have <i>Spill Response Plan</i> and ensure spill contingency equipment and measures are in place before work begins.
(3) Water Resources: surface water hydrology, surface water quality, aquatic sediments, and groundwater quality and quantity	<input type="checkbox"/> Adverse modifications to surface drainage patterns <input type="checkbox"/> Reduced water quality due to increased erosion, sedimentation, transportation of debris and contamination, etc. <input type="checkbox"/> Potential runoff, erosion, sedimentation, and altered drainage.	<input type="checkbox"/> Minimize changes to the ground surface that affects its infiltration and runoff characteristics and maintain effective surface drainage upon completion of project. <input type="checkbox"/> Minimize clearing, grubbing, and grading near water bodies. A 30 m no grub zone will be maintained adjacent to any water body-stream, river, pond, lake, etc. <input type="checkbox"/> Dewatering directly into a water body, sanitary/storm water system is not permitted. Sediment must settle out or be filtered before water is allowed to enter a drainage pathway. <input type="checkbox"/> Properly seal all boreholes. <input type="checkbox"/> Capture, contain, and clean up any spills and leaks immediately
(4) Flora and Fauna: aquatic and terrestrial species /population and communities/habitats	<input type="checkbox"/> Damage to/and or removal of vegetation in immediate or adjacent areas <input type="checkbox"/> Introduction of invasive species <input type="checkbox"/> Sensory disturbance causing displacement/habitat avoidance <input type="checkbox"/> Impeded/altered wildlife movement <input type="checkbox"/> Habitat loss/fragmentation <input type="checkbox"/> Damage to nests/dens and disruption of associated animals <input type="checkbox"/> Decreased wildlife abundance due to direct mortality from physical activities	<input type="checkbox"/> Restrict vehicular travel and other equipment operation to the construction site and approved access routes. <input type="checkbox"/> Minimize disturbance/removal of vegetation. Re-establish native vegetation where has been removed/damage and return all project areas to their original form to discourage invasive species from settling. <input type="checkbox"/> The breeding season for most birds within the project area occurs between May 1 st and August 31 st in the Maritimes, and between May 1 st and July 15 th in Newfoundland; however some species protected under the <i>Migratory Birds Convention Act</i> nest outside these timeframes. Under section 6 of the <i>Migratory Birds Regulations</i> , it is forbidden to disturb, destroy or take a nest or egg of a

		<p>migratory bird; or to be in possession of a live migratory bird or its carcass, skin, nest or egg except under authority of a permit.</p> <ul style="list-style-type: none"> <input type="checkbox"/> While most bird species construct nests in trees and shrubs, a number of species of birds nest at ground level (e.g. Common Nighthawk, Killdeer), and some species may nest in burrows in stockpiles of soil or the banks of pits (e.g. Bank Swallows) It should be ensured that activities to reduce erosion do not result in hydroseeding of nests. But that alternate measures be taken to reduce potential for erosion and that nests be protected until chicks have fledged and left the area. <input type="checkbox"/> Should active nests or birds caring for pre-fledged chicks be discovered during project activities outside the prime breeding season windows, establishment of vegetated buffer zones around nests, and minimization or activities in the immediate area until nesting is complete and chicks have naturally migrated from the area shall take place <input type="checkbox"/> Survey area for nests/dens prior to clearing. Do not clear any active nests/dens, or relocate nests/dens without a permit. <input type="checkbox"/> If nests containing eggs or young of migratory birds are located or discovered during breeding season, all activities in the nesting area should be halted until nesting is completed. <input type="checkbox"/> According to wildlife present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages. <input type="checkbox"/> Construct and orient fences in a manner that reduces impact to wildlife movement. <input type="checkbox"/> Minimize time boreholes/test pits remain open to reduce small terrestrial wildlife mortality. Properly seal when work is completed. <input type="checkbox"/> Fence excavations to prevent injuries to wildlife <input type="checkbox"/> Any instream work in fish bearing waters should only occur between June 1st and September 30th of any year. <input type="checkbox"/> Fish passage will be provided at all times. <input type="checkbox"/> Downstream flow shall be maintained during construction. <input type="checkbox"/> Suitable non-erosive materials shall be used, such as rip-rap, in appropriate areas to prevent erosion. <input type="checkbox"/> Sediment and erosion controls should be installed <i>prior</i> to the beginning of construction activities.
<p>(5) Anthropogenic/Human Environment: socioeconomic, public health, and cultural/heritage resources</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Disruption to park visitors, residents, and businesses due to changed noise, air and water quality, and traffic and changed aesthetics <input type="checkbox"/> Injuries to public and workers arising from project activities <input type="checkbox"/> Potential damage to unknown cultural/archaeological resources. 	<ul style="list-style-type: none"> <input type="checkbox"/> Evaluate site layout, access routes, and construction activities to minimize their visual impact. <input type="checkbox"/> All trenches or ditches left unattended overnight must be fenced. <input type="checkbox"/> Archaeological surveys should be conducted prior to construction. Should previously unknown archaeological resources/cultural artifacts be discovered, immediately cease work, and alert PCA archaeologist.

Table V. Environmental Effects and Mitigation Measures: Small Bridge and Culvert Rehabilitation and Replacement

SMALL BRIDGE AND CULVERT REHABILITATION OR REPLACEMENT 8 (ONLY PROJECTS THAT DO NOT REQUIRE DFO AUTHORIZATION)		
VECs	Description of Effects	Mitigations
(1) Air Quality: air quality and noise levels.	<input type="checkbox"/> Decreased ambient air quality <input type="checkbox"/> Increased ambient noise levels	<input type="checkbox"/> Ensure materials being stored/transported are covered. <input type="checkbox"/> Confine “noise” activities to daytime hours.
(2) Land Resources: soils, topography and landscape.	<input type="checkbox"/> Changes in slopes, landforms, and landscape <input type="checkbox"/> Soil compaction and rutting <input type="checkbox"/> Slope instability, due to increased spoil exposure and improper excavation and storage <input type="checkbox"/> Soil contamination	<input type="checkbox"/> Avoid activities with steep and/or sensitive slopes. <input type="checkbox"/> Keep site clearing to a minimum (maintain vegetated buffer wherever possible) and restore vegetation as soon as possible to minimize duration of soil exposure. <input type="checkbox"/> Hand clear steep slopes when possible. If prolonged exposure is expected, stabilize surface using temporary cover (i.e. grass, mulch, erosion blanket, etc.). <input type="checkbox"/> Implement Sediment /Erosion Control measures when soil is disturbed or exposed. Phase work to minimize duration of exposure of disturbed areas. <input type="checkbox"/> Maintain a consistent access route. <input type="checkbox"/> Halt construction during excessive rainfall events. <input type="checkbox"/> Capture, contain, and clean up spills and leaks immediately.
(3) Water: Resources surface water hydrology, surface water quality, aquatic sediments, and groundwater quality and quantity	<input type="checkbox"/> Adverse modifications to surface drainage patterns <input type="checkbox"/> Reduced water quality due to increased erosion, sedimentation, transportation of debris and contamination, etc.	<input type="checkbox"/> Retain vegetated buffer around water bodies. <input type="checkbox"/> Minimize changes to the ground surface that affects its infiltration/runoff characteristics and maintain effective surface drainage upon completion of project. <input type="checkbox"/> Water quality is to be maintained at all times. Only clean building material, free of particulate matter, shall be placed in water. Any equipment operating in water bodies must be cleaned prior to entering the water and inspected daily for leaks; never leave equipment in water overnight. <input type="checkbox"/> Sedimentation and erosion control mechanisms shall be installed around work area to prevent sediments from silt from entering watercourse. Periodically inspect and repair, if necessary, these structures. <input type="checkbox"/> Filter/settle out sediment before allowing water to enter any drainage pathway. <input type="checkbox"/> Capture, contain, and clean up spills and leaks immediately. <input type="checkbox"/> Instream work shall be minimized <input type="checkbox"/> All instream work must be completed in the dry using temporary stream diversions and/or pumping around to isolate the project work area from adjacent stream. <input type="checkbox"/> Downstream flow shall be maintained during construction. <input type="checkbox"/> Suitable non-erosive materials shall be used, such as rip-rap, in appropriate areas to prevent erosion <input type="checkbox"/> Every effort shall be made to ensure that replacement structures are bottomless and clear span respectively.
(4) Flora and Fauna: aquatic and terrestrial	<input type="checkbox"/> Damage to/and or removal of vegetation in immediate or adjacent	<input type="checkbox"/> Use existing roadways/disturbed areas for site access and travel within the site.

species /population and communities/habitats	<p>areas</p> <ul style="list-style-type: none"> <input type="checkbox"/> Introduction of invasive species <input type="checkbox"/> Sensory disturbance causing displacement/habitat avoidance <input type="checkbox"/> Impeded/altered wildlife movement <input type="checkbox"/> Habitat loss/fragmentation 	<ul style="list-style-type: none"> <input type="checkbox"/> Minimize removal of vegetation and disturbance to natural banks and streambed. When possible use hand clearing as it minimizes erosion and siltation. <input type="checkbox"/> Re-establish native vegetation where has been removed/damage and return all areas in and adjacent to the watercourse to their original form. <input type="checkbox"/> Only clean building material shall be placed in water. <input type="checkbox"/> According to wildlife present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages and critical times for wildlife. <input type="checkbox"/> The breeding season for most birds within the project area occurs between May 1st and August 31st in the Maritimes, and between May 1st and July 15th in Newfoundland; however some species protected under the <i>Migratory Birds Convention Act</i> nest outside these timeframes. Under section 6 of the <i>Migratory Birds Regulations</i>, it is forbidden to disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird or its carcass, skin, nest or egg except under authority of a permit. <input type="checkbox"/> While most bird species construct nests in trees and shrubs, a number of species of birds nest at ground level (e.g. Common Nighthawk, Killdeer), and some species may nest in burrows in stockpiles of soil or the banks of pits (e.g. Bank Swallows) It should be ensured that activities to reduce erosion do not result in hydroseeding of nests. But that alternate measures be taken to reduce potential for erosion and that nests be protected until chicks have fledged and left the area. <input type="checkbox"/> Should active nests or birds caring for pre-fledged chicks be discovered during project activities outside the prime breeding season windows, establishment of vegetated buffer zones around nests, and minimization of activities in the immediate area until nesting is complete and chicks have naturally migrated from the area shall take place <input type="checkbox"/> Survey area for nests/dens prior to clearing. Do not clear any active nests/dens, or relocate nests/dens without a permit. <input type="checkbox"/> If nests containing eggs or young of migratory birds are located or discovered during breeding season, all activities in the nesting area should be halted until nesting is completed. <input type="checkbox"/> Construct and orient fences/temporary dams, etc. in a manner that reduces impact to wildlife movement. <input type="checkbox"/> Any instream work in fish bearing waters should only occur between June 1st and September 30th of any year. <input type="checkbox"/> Fish passage will be provided at all times. <input type="checkbox"/> Culverts shall allow for the passage of fish. <input type="checkbox"/> Old stream crossings that interfere or prevent fish
--	--	--

		migration through the existing crossing structure shall be corrected.
(5) Anthropogenic/Human Environment: socioeconomic, public health, and cultural/heritage resources	<input type="checkbox"/> Disruption to park visitors, residents, and businesses due to changed noise, air and water quality, and traffic and changed aesthetics <input type="checkbox"/> Injuries to public and workers arising from project activities <input type="checkbox"/> Potential damage to unknown cultural/archaeological resources	<input type="checkbox"/> Evaluate site layout, access routes, and construction activities to minimize their visual impact. <input type="checkbox"/> Use appropriate signage/fences for closed areas and identify detours/alternatives. <input type="checkbox"/> If archaeological resources/cultural artifacts are discovered, immediately cease work, and alert archaeologist.
* Also see relevant mitigations listed in Table I and Table II		