



Basic Impact Analysis (BIA)

Broad Cove Bridge Demolition and Reconstruction

Terra Nova National Park of Canada
Newfoundland and Labrador

March 2016



Parks
Canada

Parcs
Canada



Parks Canada Basic Impact Analysis

1. PROJECT TITLE & LOCATION

Broad Cove Bridge Demolition and Reconstruction, Broad Cove Bridge, Route 310, Broad Cove/Northeast Arm, Newfoundland and Labrador, Terra Nova National Park of Canada, Newfoundland and Labrador

2. PROPONENT INFORMATION

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3. PROPOSED PROJECT DATES

Planned commencement: 2016-04-01

Planned completion: 2017-03-31

4. INTERNAL PROJECT FILE

TN-2015-30

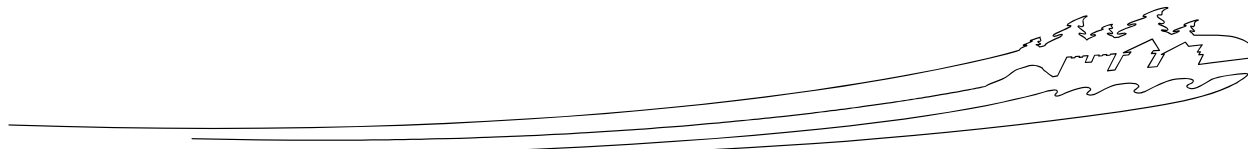
5. PROJECT DESCRIPTION

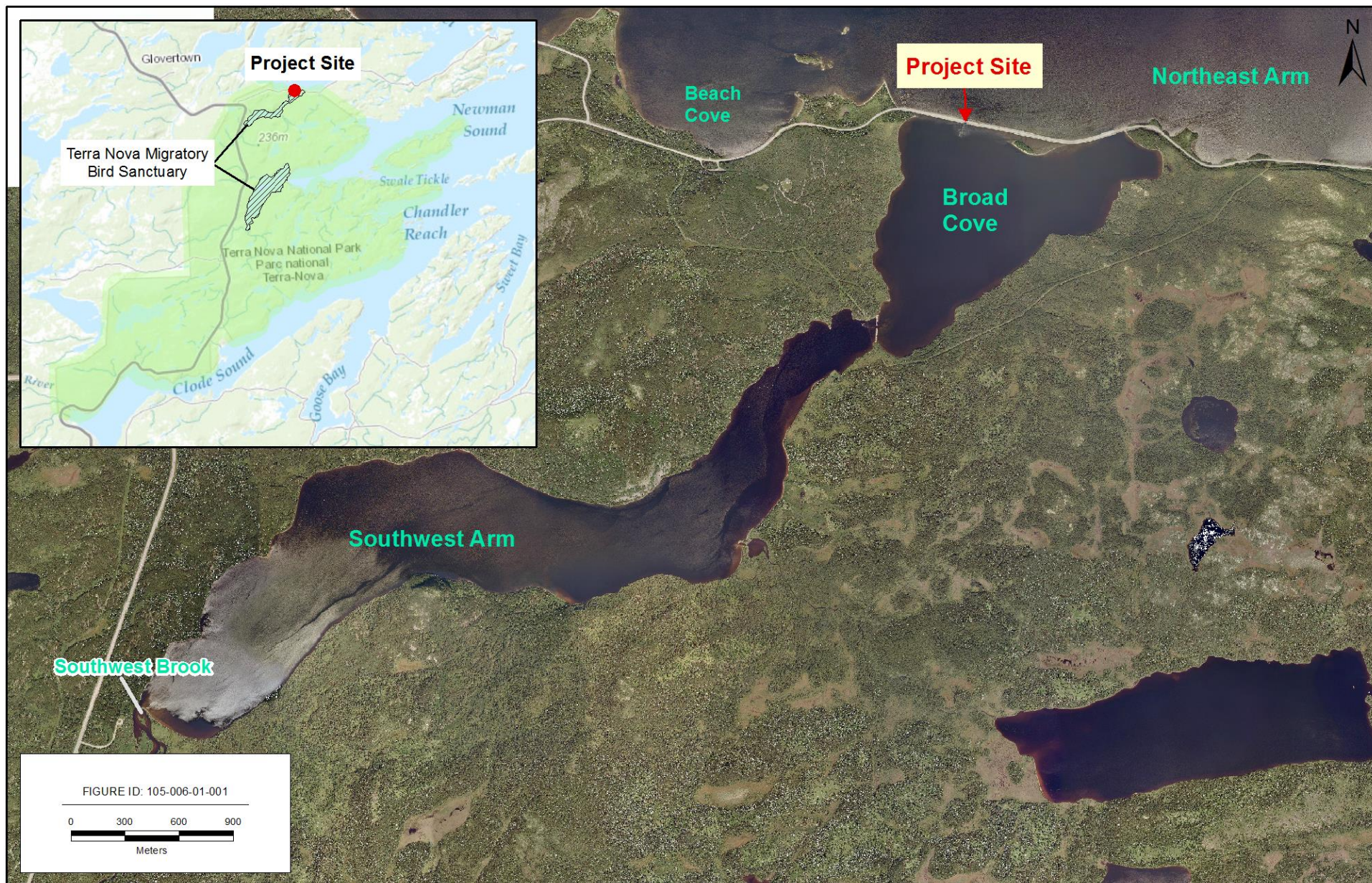
The Broad Cove Bridge is located on Route 310 in the Terra Nova National Park (TNNP) on the causeway separating Broad Cove and Northeast Arm (Figures 1 and 2). The bridge is situated on the northern extents of the upper portion of the Terra Nova Migratory Bird Sanctuary. The coordinates of the bridge are UTM NAD 83 Zone 22, Easting: 286287, Northing: 5392796.



The Broad Cove Bridge was constructed in 1964 and is a two-lane, single-span structure with steel girders and concrete deck. The existing steel girders are painted with lead containing paint. The 200 mm concrete bridge deck is overlain by a layer of asphalt concrete, ranging in thickness from 45 to 90 mm. A waterproofing membrane exists between the layer of asphalt concrete and the concrete bridge deck. Previous studies identified numerous deficiencies within the structure that required attention. PCA subsequently decided in 2015 that replacement of the existing bridge, excluding abutments, was preferred over rehabilitating the existing aging structure.

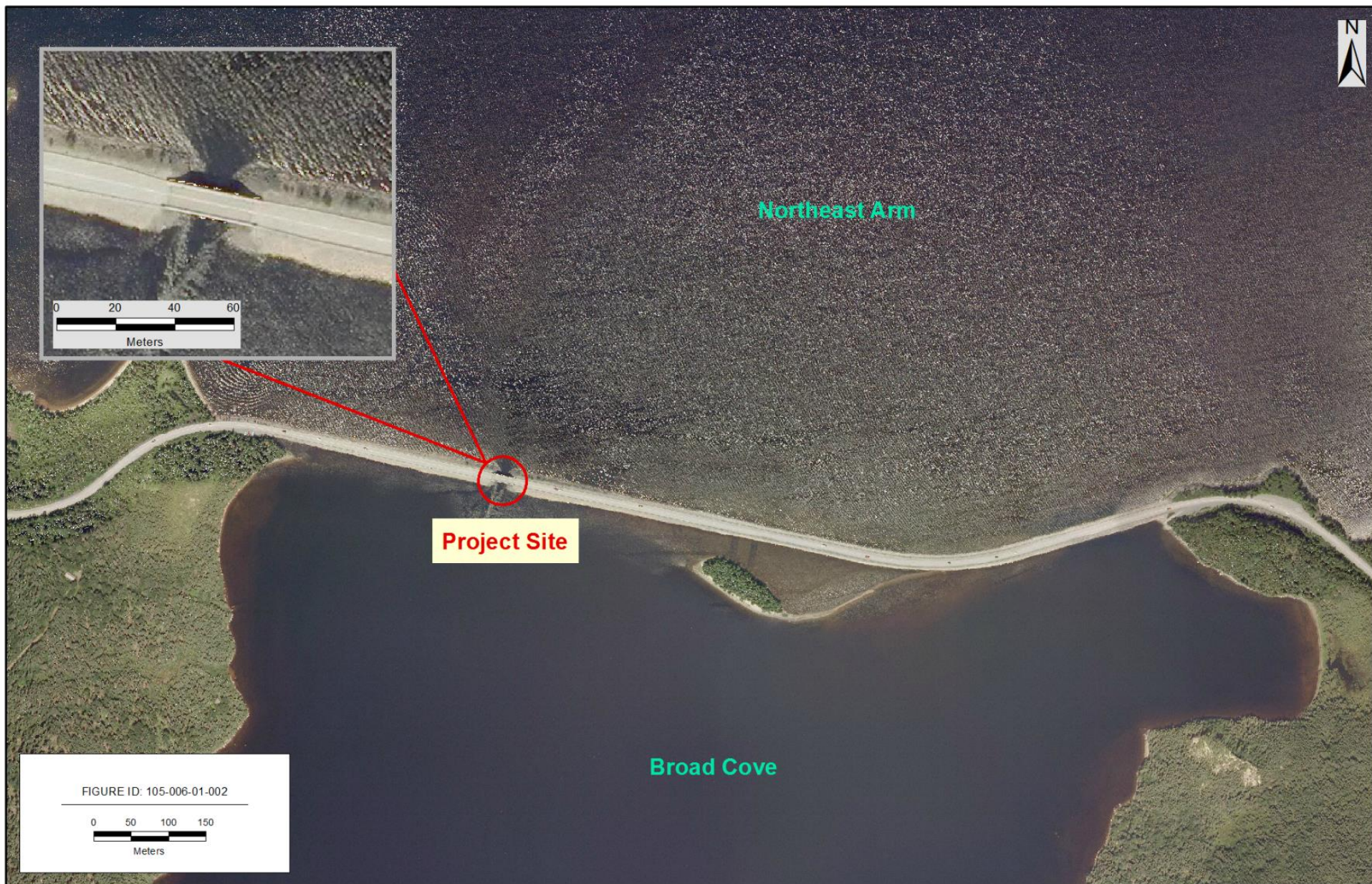
The new Broad Cove Bridge will be a 27 m two-lane, single span bridge. The replacement design will incorporate the removal of the entire deck concrete. This will require a containment deck below, hung from the existing steel beams in order to prevent loss of debris into the channel. This will include removal of the concrete curbs and aluminum traffic rails. This will be done in stages in order to maintain one lane of traffic. Once the deck is removed from one half of the bridge, the steel beams will be lifted out and transported from the site. This will leave one side of the abutments accessible for modifications to the bearing blocks and repair to the end joints and abutment concrete. The design of the replacement steel beams will be upgraded to reflect current standards (CSA-S6). The concrete deck replacement will accommodate a more efficient design and provide a higher quality, more durable structure. Reinforcing will be designed to accommodate collision design loads on the bridge barriers. Reinforcing will be glass-fiber reinforced polymer bars as per PCA request. A special stainless steel rod and coupling system will be incorporated to join the two halves of the deck together. The abutment rehabilitation design includes reconstruction of the barrier wall, wing wall and curbs to accommodate a wider roadway width. The existing expansion joints will be replaced at each end of the structure with new sealed, modular units. Approach slabs are also being incorporated in the abutment reconstruction.



Throughout construction, the bridge at Route 310 will allow for single lane of traffic and will be accomplished by automated, actuated signals with maximum 15 min. cycle/delay.





 <p>Public Works and Government Services Canada</p>	Broad Cove Bridge Demolition and Reconstruction		FIGURE NO: Figure 1	PREPARED BY: 
	Overview Map		COORDINATE SYSTEM: UTM Zone 22	DATE: 29/01/2016



 Public Works and Government Services Canada	Broad Cove Bridge Demolition and Reconstruction		FIGURE NO: Figure 2	PREPARED BY: 
	High Resolution LiDar Overview		COORDINATE SYSTEM: UTM Zone 22	DATE: 29/01/2016



Construction of the new bridge and approaches will be completed with traditional construction techniques and equipment. Equipment expected to be utilized for this project includes standard light and heavy haul equipment, backhoes, excavators, dump trucks, etc. The exact methodology for removing the lead containing paint present on the girders will be determined by the successful contractor.

The construction schedule is anticipated to commence in April 2016 and be completed in March 2017. The tentative construction schedule is as per Table 1.

Table 1 – Construction Schedule.

Description	Estimated Duration
Mobilization	3 weeks
Environmental Controls/Traffic Control	1 week
Removals	4 weeks
Concrete Patching and Repair	2 weeks
Reconstruction	12 weeks
Guiderail and Pavement Markings	1 week
TOTAL	23 weeks

6. VALUED COMPONENTS LIKELY TO BE AFFECTED

The geographic area of the valued components encompasses the general vicinity of the construction site illustrated in Figures 1 and 2. The timing of the effects are specific to each individual valued component, however, the general date range of the effects will occur between June 2016, to November 2016.

Natural Resources

Atmospheric Environment

- Air Quality
- Noise and Vibration

Terrestrial Environment

Soils and Landforms

Seven percent of TNNP is characterized as barren land, including rock barrens, kalmia barrens and transition barrens (Karim 2003). Four main types (orders) of soil are classified in the park such as Podzols, Regisols, Gleysols and Organics with Podzol being the dominant (Parks Canada 1984, 1977).

The shoreline of Broad Cove (Project area) is generally characterized by small gravel beaches or pockets of large rounded boulders and, in places, cliffs steeply rising to the adjoining wooded upland (Environment Canada, 2014).

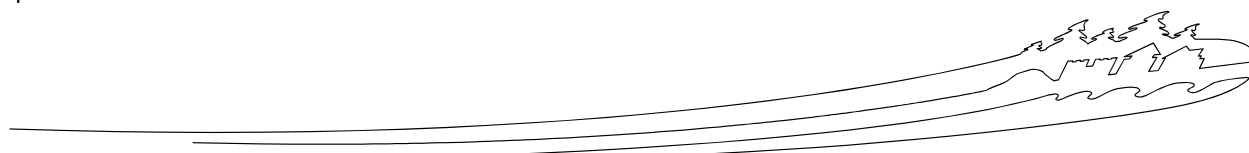
Water

According to the Terra Nova National Park Ecological Integrity Statement (2001), bald eagles, cod, capelin, sea-run trout and Atlantic salmon utilize the marine ecosystems of the park.

Northeast Arm and Southwest Arm (including Broad Cove) is a marine watercourse that is located on the north side of TNNP. The northern portion which is adjacent to the project site contains relatively shallow tidal inlets with intertidal flats in the upper reaches (Environment Canada, 2014).

Flora

Seventy-percent of the park is forested, with Black spruce (*Picea mariana*) being the dominant tree species, and smaller areas covered in Balsam fir (*Abies balsamea*) and hardwoods including white birch (*Betula papyrifera*), red maple (*Acer rubrum*) and trembling aspen (*Populus tremuloides*) (Parks Canada 2009). Alders and other similar shrubs are also found as well as ground ferns, various mushrooms and snowberries. There are 523 species of vascular plants





(Brouillet *et al.* 1998), 200 species of moss (Hedderson 1987) and 100 species of lichen (Yetman *et al.* 1999). Amongst the vascular plants, 427 are indigenous to the area, 89 introduced, 29 rare and seven hybrid species (Parks Canada 1984, 1977).

The Boreal felt lichen (*Erioderma pedicellatum*) and Blue felt lichen (*Degelia plumbea*) are two species of lichen found in the park area which are classified as Species of Special Concern by COSEWIC. There are also two species of plants of concern, the lance-leaved violet (*Viola lanceolata* L.) and Showy antennaria (*Antennaria howellii*). However, these are rare to the park (Brouillet *et al.*, 1997) and are not known to occur within or near project boundaries (personal communication, R. Cox, PCA).

Fauna

Mammals:

The TNNP has a relatively limited number of animal species. Of the 21 species of terrestrial mammals found in the park only twelve are native to insular Newfoundland and Labrador (Parks Canada 2009). The Newfoundland marten (*Martes americanus atrata*), listed as a threatened species on the List of Wildlife Species at Risk set out under the *Species at Risk Act* (SARA) and extirpated from the park in the late 1970s, has been reintroduced

Non-native mammals present in the park include moose (*Alces alces*), snowshoe hare (*Lepus americanus*) and red squirrel (*Tamiasciurus hudsonicus*). The little brown bat or little brown myotis (*Myotis lucifugus*) and Northern myotis (*Myotis septentrionalis*) are present in the park and listed as endangered under SARA.

Large mammals that may occur within the construction area include black bear (*Ursus americanus*), moose and Newfoundland caribou (*Rangifer tarandus*). The small mammals that may occur include Newfoundland marten, snowshoe hare, mink (*Neovison vison*), beaver (*Castor canadensis*), coyote (*Canis latrans*), fox (*Vulpes vulpes*), lynx (*Lynx canadensis*) and red squirrel.

Birds:

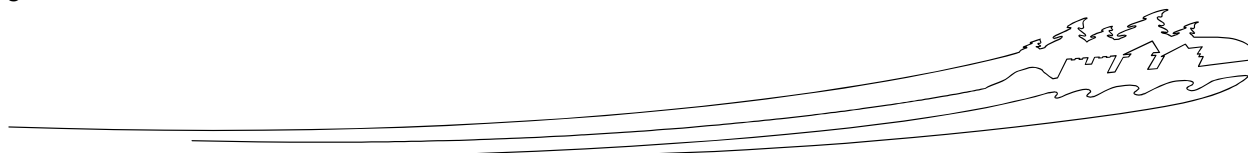
The Broad Cove Bridge is adjacent to the north side of the TNMBS (Figure 1 insert). The TNMBS is described as (that pertains to this project):

In the Province of Newfoundland those parcels of land adjacent to Terra Nova National Park being more particularly described as

- (a) all of the Southeast Arm and that portion of Broad Cove lying southwesterly of the Causeway and Bridge at the northerly end of the Cove (Government of Canada, 2016a).

There are approximately 169 bird species found in the park and 63 use the park as breeding grounds (Parks Canada 2009) and the park is also home to the Terra Nova Migratory Bird Sanctuary (TNMBS). As such, a vast variety of birds can be found near the marine shorelines and throughout the park. Nearly half of the birds on the list of species recorded at TNNP have been observed in or over the TNMBS. The main species groups are shorebirds, waterfowl and seabirds. A few hundred Canada Geese (*Branta Canadensis*), American Black Ducks (*Anas rubripes*), Common Goldeneye (*Bucephala clangula*) and Common mergansers (*Mergus merganser americanus*) use the sanctuary during fall migration, and shorebirds frequent the tidal flats during summer and early fall. While the overall numbers of migratory birds using the site are not large, the number of species is impressive. Around 30 species are recorded regularly within Newman Sound and Southwest Arm (Environment Canada 2014).

The Canada Goose, which is native to Newfoundland and Labrador, generally inhabits any type of wetland from small ponds to larger lakes and rivers. They prefer low lying areas and an abundance of ponds and lakes in which to take refuge from prey such as fox and lynx (NDOEC 2016). The primary diet of these birds include wild berries as well as grasses, grains, aquatic plants and occasionally include insects, crustaceans, small clams, snails and small fish. Spring is the most demanding time for breeding female geese and they will feed extensively during the few weeks before breeding begins. Canada Geese that breed in temperate areas, with mild temperatures, begin nesting as soon as conditions are favourable in spring, in some cases as early as mid-March. Most nest sites are located near water and





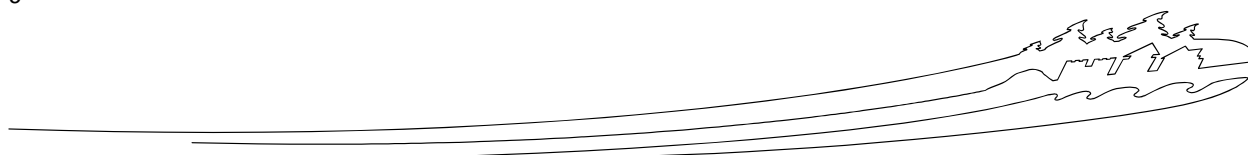
often on islands (note, there is a small island less than 1 km to the northwest from the Project site, as can be seen in Figure 1). Nest sites are chosen to offer some protection from exposure to wind while giving the incubating female a clear line of sight to detect approaching predators. Female Canada geese always return to nest in the same area where their parents nested and often use the same nest site year after year. Soon after the young have hatched, families leave their nests, sometimes walking several kilometres in a few days to reach their brood-rearing area. If the geese have nested near the seacoast, they may descend the rivers to more favourable coastal marsh areas. From the moment they leave the nest, goslings feed on grasses and sedges in meadows and along shorelines (Environment Canada 2003). Environment Canada encourages large landowners who have recurring conflicts, to develop a goose management plan to be approved by Canadian Wildlife Service (CWS). However, in general, all populations of Canada Geese are stable or increasing at the present time (Environment Canada 2015).

In Eastern Canada, breeding waterfowl populations are monitored annually through the Eastern Waterfowl Breeding Ground Survey (hereafter referred to as the Eastern Waterfowl Survey). The CWS carries out a systematic helicopter survey over the Boreal Shield region from northeastern Ontario to Newfoundland and Labrador, and the Atlantic Highlands region from the Gaspé Peninsula in Quebec to Nova Scotia. The surveys are designed and timed primarily to provide reliable breeding population estimates and trends for the American black duck, an early nesting species. Mid-winter inventories showed a decline in the continental population between 1955 and the early 1980s, when numbers began stabilizing at a low level. Trends appear to be relatively stable for most survey strata, except for the Western Boreal Shield, where the trend is declining (Environment Canada 2013). The signing of the joint Canada–United States North American Waterfowl Management Plan (NAWMP) in 1986 was an important step forward in the conservation of the American black duck. NAWMP is a plan to protect and enhance wetland habitat throughout North America. It aims to restore the populations of ducks, geese, and swans to the levels of the 1970s.

On the Atlantic coast, the American black duck is particularly abundant in coastal marshes. American black ducks are naturally alert and wary, and are among the most difficult of all ducks to deceive. They spend the daylight hours in "rafts" (flocks on the surface of the water) far out on large bodies of water where they cannot be approached. They come in to feed in fields of grain stubble or in freshwater marshes only at dusk and leave at the first streaks of dawn. The nest site is often found in a clump of grass, under a shrub or tree, or in a hole or fork in a tree, near the ground. Incubation takes up to 29 days. Once the young hatch, the surfaces of streams, lakes, marshes, and ponds are nutritious "soups" of mosquito larvae and other aquatic invertebrates and this is the sole food of the ducklings for their first two weeks. As they grow stronger they go on to tadpoles and snails, and finally begin dabbling for the seeds and tubers, or fleshy roots, of a variety of aquatic plants, as the adults do. Animal foods such as periwinkles, mussels, and various snails become increasingly important to American Black Ducks during their nonbreeding period on the coast. Birds inland continue to eat the seeds and other parts of various aquatic plants. Waste corn in harvested fields is an important food in late fall and winter, whenever it occurs near water areas used by the ducks. As temperatures drop and the feeding areas freeze over one by one, the southward migration starts. Migration tapers off in early December (Environment Canada 2016).

The Common goldeneye is a medium sized duck with a large head and small and narrow bill. Both the male and female have the bright amber eye which gives this species its name. They breed mostly in the boreal forests of Canada and they nest in tree cavities or nest boxes and often return to the same nest year after year. The young leave the nest after just one day and some females leave their broods soon after hatching. They eat mostly aquatic invertebrates and fish, and forage for seeds and tubers in fairly shallow waters. During the winter, Common goldeneye can be found in shallow coastal bays, estuaries and harbours that offer good foraging sites that often include sand, gravel, rock and boulder substrates. Threats to wintering sites include loss of coastal and interior wetlands, river channelization, and increased sediment loads due to agricultural and industrial practices that affect foraging areas. The North American Breeding Bird Survey estimates that between 1966 and 2014, populations were stable or gradually increased, however, population trends are difficult to estimate as much of the Common Goldeneye breeding range occurs north of the survey's limits (Cornell 2015a).

Common mergansers breed from Alaska, the southern Yukon, Labrador and Newfoundland, south to central California, Arizona, New Mexico, southern Chihuahua and east of the Rockies to Minnesota, Michigan, New York, New England and Nova Scotia (Ducks Unlimited 2016). These ducks live mainly on freshwater rivers and lakes, but they sometimes use saltwater estuaries in winter (Cornell 2016b). They nest in tree cavities, nest boxes, cliff crevices and on the





ground, generally near clear-water rivers in forested regions and on mountainous terrain. They nest in tree cavities in northern forests near rivers and lakes. In winter, the common merganser ranges along the Atlantic coast from Newfoundland almost to Florida. They eat mainly fish, amphibians, crustaceans, mollusks and other invertebrates obtained by diving underwater in marine and freshwater habitats. Currently, accurate population information does not exist for common mergansers, however, populations are thought to be stable (Ducks Unlimited 2016).

The Red crossbill (*Percna* subspecies, unique to insular Newfoundland) is found in the park area and is classified as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The Olive sided flycatcher (*Contopus cooperi*), the rusty blackbird (*Euphagus carolinus*) and the short eared owl (*Asio flammeus*) are also species at risk within the park (COSEWIC). Other birds in the park area include osprey (*Pandion haliaetus*), eagle (*Haliaeetus leucocephalus*), ruffed or spruce grouse (*Falci pennis canadensis*), great horned owl (*Bubo virginianus*), boreal owl (*Aegolius funereus*), loon (*Gavia* genus), tern (*Sternidae* family), greater yellowleg (*Tringa melanoleuca*), spotted sandpiper (*Actitis macularius*), white-winged crossbill (*Loxia leucoptera*), hawk owl, finches (*Fringillidea*) and ducks (*Anatidae* family). Barrow's Goldeneye (*Bucephala islandica*), listed as Special Concern under SARA, have also been observed in the general vicinity of the project site.

Cultural Resources

The Cultural Resource Values Statement for Terra Nova National Park has been reviewed for the project. No known historic/archaeological resources exist within the project area and are unlikely to be affected by this project.

Visitor Experience (VE)

The construction period will take place during tourist season; there will be some traffic delays during construction activities to visitors travelling along Route 310. Seaside camping as well as canoe and kayakers use Southwest Arm, however, few are likely to venture up through Broad Cove to Northeast Arm. Smelt fishing occurs at Northeast Arm, inside of Cull's Harbour Causeway and outside of Eastport Causeway, from January 15 to April 15, 2016, May 15 to September 7, 2016 and likely be similar for early 2017. While smelt are present in the estuary, their migration through this area would likely mostly occur at night.

Health and Socio-economic (related to Aboriginal and non-Aboriginal peoples)

There are no predicted aspects of the project that would result in direct or indirect impacts to Aboriginal and non-aboriginal peoples. As well there are no known traditional uses of the lands and/or resources in the project area that would be impacted by the project.

7. EFFECTS ANALYSIS

Natural Resources

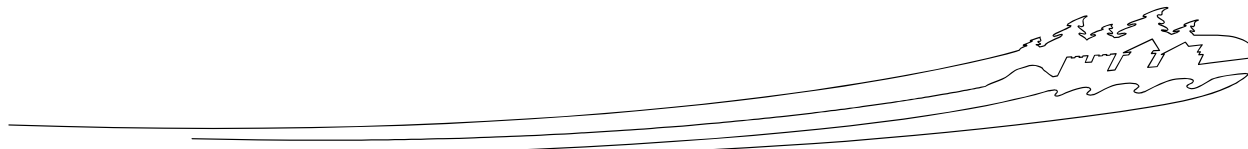
Atmospheric Environment

- Air Quality: During construction activity, air quality may be reduced due to air borne dust particles and lead paint particles. Heavy equipment exhaust may also affect air quality during construction.
- Noise and Vibration: Due to the location of the project being within the park, noise from heavy equipment and busting equipment may affect visitors in the area. In addition to visitors it may pose a problem for wildlife, birds, and fish species near the construction site.

Terrestrial Environment

Soils and Landforms

There are the potential impacts from soil compaction, erosion and contamination due to accidental spills and improper disposal of lead contaminated construction wastes. Soil compaction is a form of soil degradation that can lead to soil erosion and decreased flora productivity. Compaction is the compression of soil particles into a smaller volume which





reduces the pore size available for air and water. This in turn leads to impaired water infiltration, root penetration and flora nutrient and water uptake. This will restrict root growth and penetration into the subsoils, leading to stunted and stressed plants. Compaction also leads to increased potential for surface water ponding, water runoff, surface soil waterlogging and erosion (Wolkowsky and Lowery, 2008).

Water

As the majority of work will be taking place at Northeast Arm and Broad Cove, sediment and other deleterious substances have the potential to be released through bank erosion, leaks, refueling, spills, and demolition of the current bridge and construction of the new bridge. This includes the potential for lead paint contaminated construction debris entering the watercourse. There will not be a disruption of fish migration and passage, changes in channel morphology, water quality or a permanent loss of fish habitat as a result of this project. The residual impact to fish and fish habitat will be negligible.

Noise and vibrations caused by construction machinery and related activities are also issues which could affect the freshwater environment, specifically sensitive tissues in fish (i.e., swim bladder) and their behavior.

Navigation Consideration (to be completed by Transport Canada)

Environmental effects of the project on navigation are taken into consideration as part of the environmental assessment only when the effects are indirect, i.e., resulting from a change in the environment affecting navigation. Direct effects on navigation are not considered in the environmental assessment, but any measures necessary to mitigate direct effects will be included as conditions of the *Navigation Protection Act* approval.

☒ Only direct effects are identified; therefore the effects of the project on navigation are not addressed in this environmental assessment.

☐ Indirect effects were identified and have been addressed in this environmental assessment.

Fauna

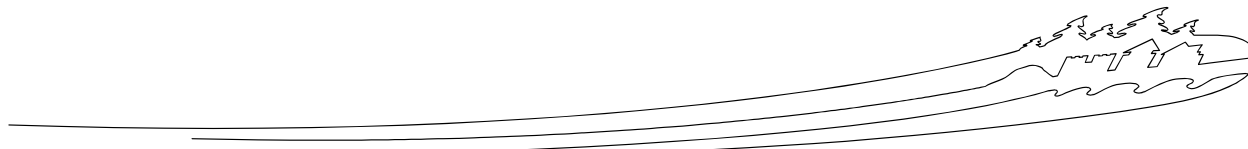
Short-term disturbances are predicted for mammals and birds that are in the vicinity of the construction site during mobilization of equipment and the operation of equipment during construction. The temporary operation of equipment and increased human presence and noise may lead to a temporary displacement of wildlife.

A search of the Atlantic Canada Conservation Data Centre (ACCDC) database was conducted which produced a list of rare/unique species (i.e., plants and animals) within a 5 km buffer zone (standard ACCDC procedure) of the site of the proposed work. All species were cross-referenced with Schedule 1 of the SARA and the following species at risk were identified: 1) Newfoundland Marten (*Martes Americana*) - Threatened.

The distribution range of the Newfoundland Marten (SARA Schedule 1 Species - Threatened Status) overlaps with the general project areas, but given the physical attributes of the project location (exposed coastal area), the small spatial and temporal extent of the proposed project as well as the population density of this species, it is unlikely that the project will result in any impacts to critical habitat or individuals of this species. However, should any member of this species be identified within the project footprint during project activities, work should be halted and Parks Canada staff notified immediately.

Visitor Experience (VE)

- Traffic: The aesthetic and visual impacts of the presence of machinery during construction are expected to be minimal due to the size of equipment and duration of the project. The project will have a direct impact on traffic in the area due to reduced speeds and delays at the construction site. Throughout construction, the bridge at Route 310 will allow for single lane of traffic and will be accomplished by automated, actuated signals with maximum 15 min. cycle/delay.
- Fishing: If any construction activity is completed during fishing season it may impact the natural conditions in which a fisherman usually fishes for smelt. The construction noise and aesthetics of the equipment may





affect the way fishermen fish near the construction site. Smelt migration is usually observed at night, when there will be little to no construction activity. Atlantic salmon are known to migrate under the bridge to access both Wing's brook and Southwest Brook which flow into Southwest Arm. There is no salmon angling permitted at this location. However, angling in this area for sea-run trout is known to occur. Should any salmon, sea run brook trout, or any other species of fish (as defined under the Fisheries Act) be observed during project activities, the project will halt until the fish have dispersed.

- Airborne lead containing dust particles and construction debris/waste could have a negative health and safety impact on nearby fishers.

8. MITIGATION MEASURES

The mitigation measures listed are standard construction measures that are typically used in construction projects. It may be acceptable for deviations from some of these measures and the ones listed below are to be used as a guide. The overall implementation of mitigation and controls will be the responsibility of the contractor selected to complete the work.

Natural Resources

Atmospheric Environment

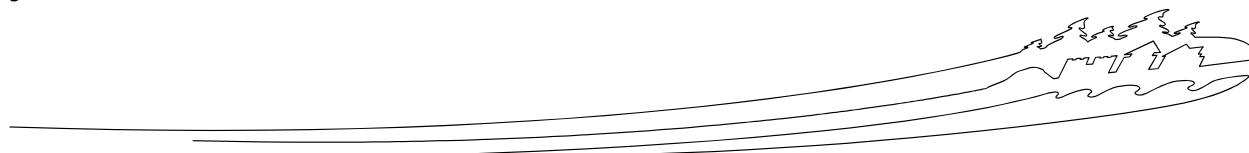
- All equipment (e.g., diesel generators, etc.) shall meet the requirements of applicable federal legislation/regulations.
- Best Management Practices shall be implemented to mitigate air quality effects where practical.
- Dust from operating activities will be controlled using water. In the event of excessive dust, water will be applied to travel and work surfaces.
- All vehicles and generators will have exhaust systems regularly inspected and mufflers will be operating properly to meet emission standards.
- Operators will be aware of birds in the area and will stop work should the birds appear to be negatively affected by the noise.
- Adherence to all permits and approvals.
- The contractor must submit an environmental protection plan outlining how the contractor intends to adhere to environmental protection requirements, including, but not limited to, the proper containment and disposal of lead contaminated wastes and debris. Lead containing dust, waste or debris is not permitted to become enter the environment (air, soil and water), pose a health and safety risk to workers or visitors near the site, and must be transported and disposed of at an approved off-site location in accordance with application legislation and regulations.

Terrestrial Environment

Soils and Landforms, Flora and Fauna

Due to the location of the Project in relation to the TNMBS, the *Migratory Birds Convention Act (MBCA)* and the *Migratory Bird Sanctuary Regulations* will be followed. These provide regulations that prohibit the taking, injuring, destruction or molestation of migratory birds, their nests or eggs within established sanctuaries. The *MBCA* (Section 2) interprets "bird" as including "the sperm, eggs, embryos, tissue cultures and parts of the bird" and covers more than 700 bird species, including waterfowl, shorebirds, songbirds and seabirds. This also emphasizes various conservation principles, including "to provide for and protect habitat necessary for the conservation of migratory birds." The *MBCA* applies to all lands and bodies of water in Canada and to the activities of all organizations, industries and individuals. Hunting of listed species is not permitted in any MBS (Government of Canada, 2016b).

Prior to initiating construction, an environmental professional should complete a survey of all terrestrial habitat to be disturbed during construction to look for residences (dens) of small mammals and nesting sites of birds/waterfowl for any 'species at risk' or 'species of concern', in consultation with Parks Canada staff. If any residences and/or nesting sites associated with species at risk or species of concern are encountered proper procedures will be followed by the



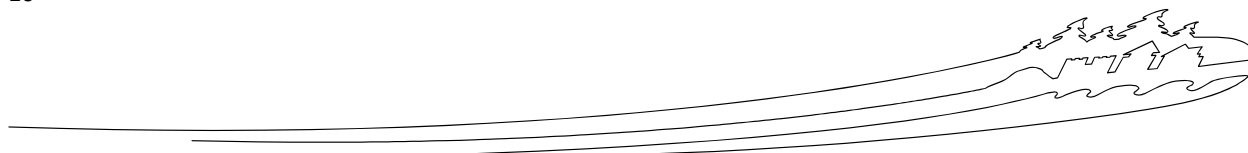


contractor and information shared with Parks Canada. This could result in a delay in scheduling of the construction. Due to the proximity of the construction site to Route 310 and the location of the causeway, no impacts are anticipated as there shouldn't be any nesting sites within the construction area. If nesting sites are found during construction, the contractor will follow mitigations outlined in their environmental protection plan (EPP).

In the unlikely case that a species of special concern is spotted such as the Boreal felt lichen and Blue felt lichen, the contractor will stop work immediately and report the sighting to Parks Canada staff. It is recommended that a high level field survey is conducted by a qualified environmental professional prior to clearing to ensure no species of concern is present in the area.

The timely completion of work will minimize the duration of impacts to mammals and birds from noise and increased human presence.

- Vehicles will yield the right-of-way to wildlife.
- No personal pets, domestic or wild, will be allowed on the site.
- All personnel should be aware of the potential for encounters with bears, caribou, moose, etc. and they will be instructed to immediately report any sightings. No attempt to harass or disturb wildlife will be made by any worker.
- The best approach will be identified based on the circumstances and in compliance with the *MBCA*. Should a nest of birds listed in the Canadian Wildlife Service (CWS) Occasional Paper Birds Protected in Canada under *MBCA* be encountered during the proposed work program, the CWS and Parks Canada will be contacted.
- If vegetation clearing is required, the work will be completed as much as possible after the period when migratory birds may be breeding in a particular habitat. The CWS has directed that in order to avoid direct bird mortality, all vegetation clearing activities should occur outside of the local breeding season for land birds.
- Nests, eggs and nest shelters of migratory birds must not be disturbed or destroyed. Where possible, clearing activities should occur outside the bird nesting season. If a nest is found, a 20 m radius will be implemented and left undisturbed until nesting is completed, and construction activities should be minimized in the immediate area until nesting is completed.
- If the nest of any raptor is encountered during construction and operation activities, work in the vicinity of the nest is to be curtailed until Parks Canada staff has been contacted and appropriate mitigation is applied. This includes a 200 m buffer zone around any active raptor nest during most of the year, extending to an 800 m buffer zone during the breeding season (March 31 to July 31).
- If any Species at Risk, such as Newfoundland marten, are encountered, all work will stop and sightings will be reported immediately to Parks Canada staff.
- Machine operators will be briefed on proper food and garbage disposal and other wildlife issues before work begins.
- All solid waste will be handled according to and in compliance with applicable federal/provincial regulations and will be considered for reuse, resale or recycling at an approved facility.
- Work areas will be kept clear of waste and litter to reduce the potential for attracting wildlife and reducing potential interactions with wildlife. Any waste that may attract animals (i.e., food) will be stored in covered, wildlife-proof containers.
- Burning of waste is not permitted without appropriate permits.
- Ensure proper cleaning of machinery/vehicles to prevent potential spread of invasive species.
- Vegetation/tree clearing is not anticipated as part of this project. However, if trees and shrubs are to be removed, they will be cut flush with the ground wherever possible. Clearing will consist of cutting to within 15 cm of the ground and disposing of all standing trees, as well as removing all shrubs, debris and other vegetation from the area. These materials will be stacked clear of on-going activities for future rehabilitation. The *Environmental Protection Guidelines for Ecologically Based Forest Resource Management* (DFRA 1998) will be observed. Additionally, No roadside vegetation clearing will be permitted during the annual songbird nesting period of May 1st - July 15th.
- If required, there will be no cutting in areas designated as sensitive without notification and approval.
- If required, clearing activities will comply with the requirements of all applicable permits.



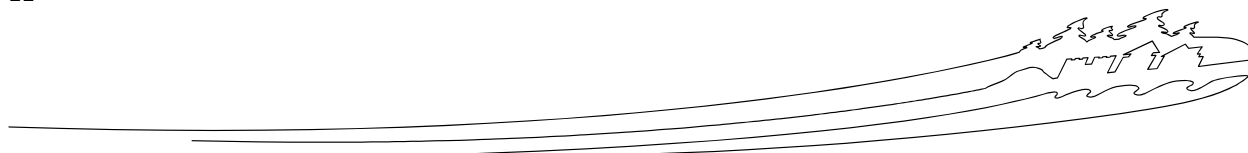


- If required, chain saws or other hand-held equipment will be used in clearing vegetation except where alternative methods or approved equipment (mechanical harvesters) are used. The use of mechanical clearing methods, such as bulldozers, will not be permitted except where it can be demonstrated that there is no merchantable timber, and where the resulting terrain disturbance and erosion will not result in the loss of topsoil or the sedimentation of nearby waterbodies.
- If grubbing is required, the organic vegetation mat and/or the upper soil horizons will be restricted to the minimum area required. It will be spread, in a manner to cover inactive exposed areas or retained for use in rehabilitation efforts.
- If grubbing is required, the grubbed material will not be pushed into areas that are to be left undisturbed. Grubbing material will be buried with 60 cm of soil cover.
- Disturbance and/or clearing sensitive wildlife areas (e.g., riparian vegetation) will be avoided during site preparation, where possible, to minimize the physical footprint of the Project.
- Existing laydown and storage areas will be used, where feasible.
- All vehicle and equipment use will be restricted to designated routes within and between work, laydown, maintenance and storage areas.
- Travel in areas outside designated work areas will not be permitted.
- Heavy equipment (e.g., dump trucks and front-end loaders) will only be used in work areas.
- If required, reclamation techniques will emphasize the revegetation of the sloped and cleared areas of the site with local plants, shrub and trees approved by Parks Canada.
- The contractor must submit an environmental protection plan outlining how the contractor intends to adhere to environmental protection requirements, including, but not limited to, the proper containment and disposal of lead contaminated wastes and debris. Lead containing dust, waste or debris is not permitted to become enter the environment (air, soil and water), pose a health and safety risk to workers or visitors near the site, and must be transported and disposed of at an approved off-site location in accordance with application legislation and regulations.

Water

All construction work will follow standard environmental practices to ensure the aquatic environment is not harmed and biological processes are not interrupted. The construction plan will be dependent upon the selected contractor. General wording conditions will be included in the tender documents to cover all aspects of environmental protection including the removal of the existing bridge, such as no debris or deleterious material are to enter the watercourse and that the contractor is to supply an environmental control plan for approval prior to commencing work. Typically, equipment for this work will include excavators, cranes, dump trucks, hydraulic busters, etc. Work is expected to include cutting barriers and deck for removal of concrete and girders in sections. The contractor will be responsible for ensuring proper procedures are followed while using heavy equipment near a water body, such as switching lubricants to vegetable oil, refuelling away from water and having a spill response plan in place and spill kits onsite.

- It is recommended that a full time environmental monitor be present during construction activities to ensure all mitigations are in place and working properly, and will work closely with the contractor and Parks Canada staff.
- When working within 15 meters of the watercourse, the environmental monitor will observe the river to ensure there is no migrating salmon present. If migrating salmon is spotted all work will be stopped until the environmental monitor deems the river clear of salmon.
- All in-water work will be scheduled to avoid periods of high water flow and rainfall.
- Poured concrete and concrete wash-water is not permitted to enter the watercourse at any time.
- Work will be conducted with the minimum amount of disturbance necessary. All works within 15 m of waterbodies or watercourses will strictly follow the requirements outlined in the acquired watercourse alteration approvals from the NDOEC and following mitigations recommended by DFO. Work will be conducted in a manner that prevents potential sedimentation of watercourses and waterbodies in or adjacent to the work areas.
- All activities must conform to relevant Provincial Occupational Health and Safety Guidelines and to all relevant Municipal, Provincial and Federal regulations.



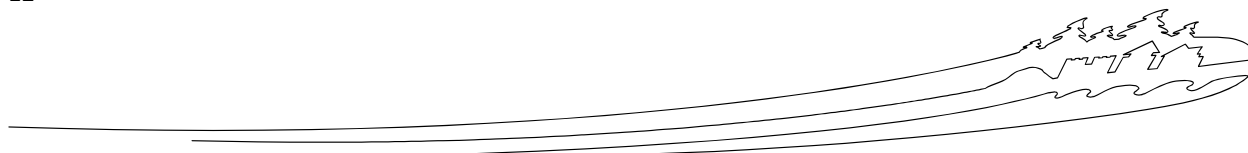


- Where grubbing is required, measures will be implemented to reduce and control runoff of sediment-laden water during grubbing, and the re-spreading and stockpiling of grubbed materials. Where grubbed materials are re-spread or stockpiled, as many stumps and roots as possible will be left on the ground surface to maintain soil cohesion, dissipate the energy of runoff and promote natural re-vegetation. Erosion control measures will be implemented in areas prone to soil loss.
- If grubbing is required, the length of time that inactive grubbed areas will be left exposed to the natural elements will be minimized to prevent unnecessary erosion. Mitigations such as the placement and maintenance of silt curtains or deployment of hay bales will be used to prevent erosion from exposed areas.
- Slash and any other material or debris related to construction or operations activities will not be permitted to enter any watercourse, and will be piled above spring flood levels and retained for final rehabilitation efforts.
- If required, overburden storage areas will be located at least 50 m from any waterbody on well-drained soil and will be stored in stable piles and sloped to prevent pooling.
- If required, collection ditches and settling ponds may be used to manage surface runoff from overburden stockpiles.
- If any new laydown, maintenance or storage areas is required for construction and operations activities, they will only be established within the project footprint, and will follow the procedures for vegetation clearing, grubbing and debris disposal, and erosion prevention.
- Storage areas will be placed on level terrain and kept free of ponding or run-off.
- A buffer zone of undisturbed vegetation will be maintained between Project activities and all watercourses as much as possible.
- All areas of exposed erodible soil will be stabilized by back-blading, grading and/or compacting to meet engineered slope requirements.
- Primary means for controlling erosion is avoiding activity that contributes to erosion. The disturbance of new areas will be minimized and work shall not be undertaken on easily erodible materials, and during or immediately following heavy rainfalls without approved protection measures in place.
- Existing or new siltation control structures used in this work will be monitored by the contractor for excessive accumulation of sediment. The contractor will remove accumulated sediment from control structures to gain full effectiveness of the systems. Effluent from control structures will be released to flow overland for appropriate filtration prior to entering any waterbody.
- If an environmental inspection reveals that silt is entering any waterbody, further mitigative measures will be implemented, such as temporary drainage ditches, siltation control (settling) ponds, ditch blocks/check dams or sediment dam traps, to intercept run-off. The necessary or appropriate measures will be determined in the field.
- Surface water shall be directed away from work areas by ditching. Runoff from these areas shall have sediment removed by filtration or other suitable methods and shall be directed away from wetlands and watercourses.
- The contractor must submit an environmental protection plan outlining how the contractor intends to adhere to environmental protection requirements, including, but not limited to, the proper containment and disposal of lead contaminated wastes and debris. Lead containing dust, waste or debris is not permitted to become enter the environment (air, soil and water), pose a health and safety risk to workers or visitors near the site, and must be transported and disposed of at an approved off-site location in accordance with application legislation and regulations.

For the purposes of this section, cultural resources components, VE components and health/socio-economic components are considered under human environment.

Human Environment (Cultural Resources, VE Components, Health/Socio-Economic)

- All construction personnel are responsible for reporting any unusual materials unearthed during construction activities to the on-site supervisor. In those situations where the find is believed to be an archaeological/cultural resource, the construction Supervisor and/or contractor will immediately stop work in the vicinity of the find and notify PWGSC/Parks Canada immediately.





- The contractor is responsible to take all necessary precautions to ensure there are no safety concerns related to visitors of the Park.
- The contractor is responsible to ensure all parties (i.e., Park Staff, Sub-Contractors, etc.) receive a copy of the EPP or BIA prior to project start-up.
- All vehicles and equipment will yield to people, if present, and reduced speeds will be maintained on all roadways.
- The handling and storage of hazardous materials will follow all applicable federal legislation/regulations. All relevant current Material Safety Data Sheets (MSDS) will be readily available for the site.
- Throughout construction, the bridge at Route 310 will allow for single lane of traffic and will be accomplished by automated, actuated signals with maximum 15 min. cycle/delay.
- The contractor must submit an environmental protection plan outlining how the contractor intends to adhere to environmental protection requirements, including, but not limited to, the proper containment and disposal of lead contaminated wastes and debris. Lead containing dust, waste or debris is not permitted to become enter the environment (air, soil and water), pose a health and safety risk to workers or visitors near the site, and must be transported and disposed of at an approved off-site location in accordance with application legislation and regulations.

General Construction Measures

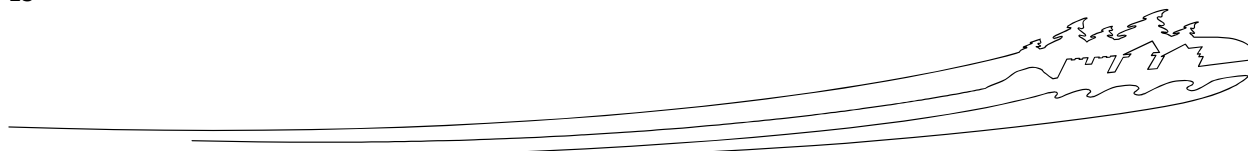
The contractor will submit an environmental protection plan with their bid and will not start work until the plan has been accepted by the owner's team (Parks Canada). The contractor should be familiar with all applicable regulations and guidelines that may apply to the project. It is the sole responsibility of the contractor to comply with the applicable regulations and permit requirements.

It is recommended that an EPP be prepared in accordance with DFO's *Fisheries Act*. To ensure mitigation of potential adverse effects identified, the EPP shall:

- Be available to all staff during project activities;
- Include an Erosion and Sedimentation Management Plan that will detail appropriate work methods and best practices for working around water and proposed erosion control methods. Parks Canada's desired end result is to allow no release into any water body of sediments in levels that are deleterious to fish, fish habitat, wildlife habitat or that would alter growing or hydraulic conditions;
- Contain spill response procedures including appropriate spill kit requirements and spill and emergency response contacts; and
- Include provisions to reduce human-wildlife interactions.

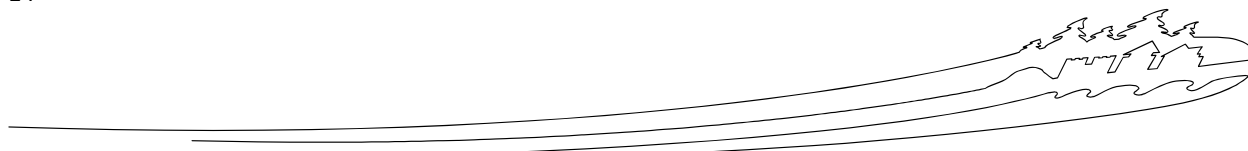
Additional Measures

- Machinery is to arrive on-site in a clean condition and should be free of soils and vegetation and maintained free of fluid leaks. For all contractors, Spill Response Kits (absorbent materials, etc.) must be on-site at all times. In the event of any spill of deleterious substances (e.g., petroleum hydrocarbons, hydraulic fluid), the contractor is responsible for containing and cleaning up the spill; the spill is to be reported and sent to Parks Canada. In the event of a reportable spill on-land or a spill, regardless of size, in the freshwater environment, applicable federal legislation/regulations will be followed.
- In reaching decisions on containment and clean-up procedures, the following criteria will be applied:
 - minimize danger to workers and public;
 - protect water supplies;
 - minimize pollution of watercourses;
 - minimize area affected by spill; and
 - minimize the degree of disturbance to the area and watercourses during clean-up.
- All work relating to the construction and operations activities for the Project will be conducted according to the conditions set out in the permits and/or approvals and authorizations.





- Only minor repairs and maintenance (e.g., lubrication) of 'non-mobile' equipment such as flatbeds, shovel or drilling equipment will be performed on-site. All major repairs, where possible, are to be performed at an existing garage location outside of the project area.
- All fuel and other hazardous materials will be handled following applicable federal legislation/regulations.
- In addition to spill kits located at fuel storage tanks additional spill kits will be located at designated central storage location(s). Personnel who deal with fuelling, fuel transfer and pumps and generators will be trained in the use of the kits.
- All necessary precautions will be taken to prevent and reduce the spillage, misplacement or loss of fuels and other hazardous materials.
- A spill is defined as reportable, depending on the class and quantity of dangerous goods involved, which varies between applicable Regulations:
- In the event of a leak from a vehicle, pipeline or storage tank system, the operator of the vehicle, pipeline or storage tank system shall immediately notify Parks Canada staff and PWGSC and take those steps that are necessary to abate the discharge, clean the area affected
- Only workers who are qualified and trained in handling these materials as stated in the manufacturer's instructions and government laws and regulations will handle fuel and other hazardous materials.
- Operators will attend the entire refuelling operations.
- Despite measures taken to reduce the potential for spills or leaks, should any soils be contaminated by petroleum hydrocarbons, they will be assessed and managed in accordance with the applicable federal legislation/regulations
- Handling and fuelling procedures will comply with the applicable federal legislation/regulations and any additional requirements in order to limit potential contamination of soil or water, and will not occur within 100 m of any water body. Drums will be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry building with an impermeable floor or outside with appropriate spill containment (110%) and covers.
- Contracted fuel suppliers will, before transporting or positioning fuel or oil, have a copy of their fuel and hazardous material spills contingency plan. Transportation of hazardous and dangerous materials shall be conducted in accordance with provincial, territorial and federal transportation regulations. Transportation documents shall be retained in a retrievable filing system and stored for the duration of the undertaking.
- Smoking will be prohibited within 10 m of a fuel storage area.
- Small quantities of hazardous material (drums, cans and other containers under 20 L volume) will be stored in a secure location protected from weather and freezing, as well as vehicle traffic.
- Hazardous waste will be moved to an appropriate hazardous waste storage area. These areas are constructed in compliance with all applicable federal and provincial legislation.
 - All hazardous waste will be handled according to the applicable federal legislation/regulations. Waste classified as "hazardous" or "special" that cannot be disposed of in regular landfill sites will be sent for disposal to a licensed hazardous waste management company.
 - Waste material will not be disposed of on-site or in a body of water.
 - Burning of waste is not permitted.
 - Where hazardous waste materials are to be stored outdoors, a designated area will be established, graded and fitted with an impermeable membrane covered with local soil and surrounded by an earth berm.
 - Waste oils, lubricants, and other used oil will be retained in an approved tank or closed container, and disposed of in accordance with the applicable federal legislation/regulations.
 - Any soil contaminated by small leaks of oil or grease from equipment will be disposed of according to the applicable federal legislation/regulations.
 - All hazardous wastes generated, by alternative treatments will be handled according to the procedures for handling fuel and hazardous materials.





9. PUBLIC/STAKEHOLDER ENGAGEMENT & ABORIGINAL CONSULTATION

9 a) Indicate whether public/stakeholder engagement was undertaken in relation to potential adverse effects of the proposed project:

☒ No

☐ Yes (describe the process to involve relevant parties and indicate how comments were taken into consideration).

9 b) Indicate whether Aboriginal consultation was undertaken in relation to potential adverse effects of the proposed project:

☒ No

☐ Yes (describe the process to involve relevant parties and how the results were taken into consideration).

10. SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

The temporal and spatial scope of the project are limited, and considering the work techniques, time of year and common mitigation measures involved there are no significant adverse environmental effects anticipated as a result of this project.

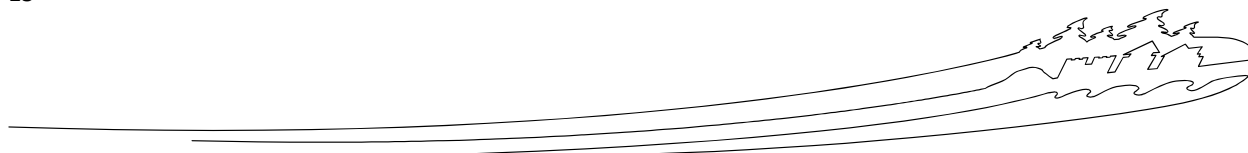
This project is not likely to cause significant residual effects and there are no predicted cumulative effects associated with the project.

11. SURVEILLANCE

☐ Surveillance is not required

☒ Surveillance is required (provide details such as the proposed schedule and the focus of inspections)

Due to the fact that the project is located within a National Park it is recommended that inspections be conducted to ensure proper mitigations measures are being implemented properly.





12. FOLLOW-UP MONITORING

Follow-up monitoring is:

- ☒ not required
- ☐ required by legislation or policy (indicate basis of requirement – e.g., required by the *Species at Risk Act*; *Fisheries Act*, or the *Parks Canada Cultural Resource Management Policy*)
- ☐ required to evaluate effectiveness of mitigation measures and/or assess restoration success

13. SARA NOTIFICATION

Notification is:

- ☒ not required
- ☐ required under the *Species at Risk Act* (outline the nature of and response to any notification).

14. EXPERTS CONSULTED

Include Parks Canada experts. Add as many entries as necessary for the project.

Department/Agency/Institution: Transport Canada, Navigation Protection Program	Date of Request: 2016-01-25
Expert's Name & Contact Information: Glen Rowe	Title: Navigation Protection Officer
Expertise Requested: Applicability of Navigation Protection Act (NPA)	
Response: Legislation applies, NPA application required and submitted.	

Department/Agency/Institution: Transport Canada, Environmental and Indigenous Affairs Program	Date of Request: 2016-01-25
Expert's Name & Contact Information: Melissa Ginn	Title: Environmental Officer
Expertise Requested: Specialist advice for inclusion in BIA report	
Response: Comments received and incorporated	

Department/Agency/Institution: Environment Canada	Date of Request: 2016-02-16
Expert's Name & Contact Information: Jerry Pulchan	Title: Environmental Assessment Analyst
Expertise Requested: Specialist advice related to potential project impacts on adjacent migratory bird sanctuary	
Response: Specialist advice provided and incorporated into report (Attachment #1).	





15. DECISION

Taking into account implementation of mitigation measures outlined in the analysis, the project is:

- ☒ not likely to cause significant adverse environmental effects.
- ☐ likely to cause significant adverse environmental effects.

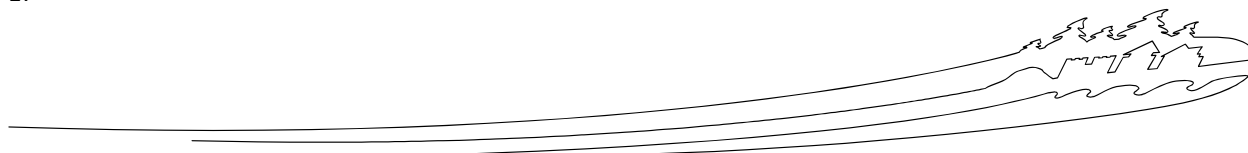
NOTE: If the project is identified as likely to cause significant adverse effects, CEEA 2012 prohibits approval of the project unless the Governor in Council (Cabinet) determines that the effects are justified in the circumstances. A finding of significant effects therefore means the project CANNOT go ahead as proposed.

FOR SARA REQUIREMENTS:

- ☒ There are no residual adverse effects to species at risk and therefore the SARA-Compliant Authorization Decision Tool was not required

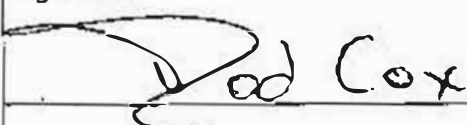
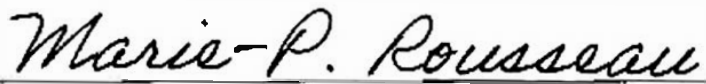

OR, the SARA-Compliant Authorization Decision Tool ([Appendix 2](#)) was used and determined:

- ☐ There is no contravention of SARA prohibitions
- ☐ Project activities contravene a SARA prohibition and CAN be authorized under SARA
- ☐ Project activities contravene a SARA prohibition and CANNOT be authorized


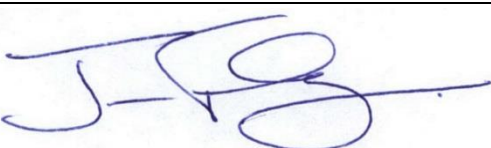



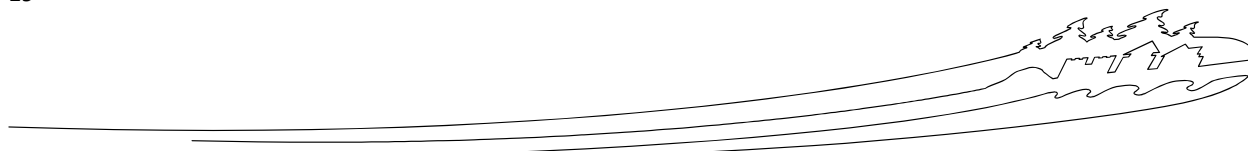


16. RECOMMENDATION AND APPROVAL

Prepared by: Crystal Kehoe, Director of Health & Safety / Quality Management Sikumiut Environmental Management Ltd	Date: 2016-02-04
Reviewed by: Mark McNeil, Environmental Specialist Public Services and Procurement Canada	Date: 2016-03-24
Signature: 	
Recommended by: Rod Cox – Resource Management Officer Parks Canada	Date: March 29/16
Signature: 	
Recommended by: Marie-Pascale Rousseau – Project Manager Parks Canada	Date: March 30th 2016
Signature: 	
Approved by: William Brake – Superintendent, Newfoundland East Field Unit Parks Canada	Date: March 29/16
Signature: 	

**TRANSPORT CANADA**

Project Title:	Broad Cove Bridge Demolition and Reconstruction, Terra Nova National Park of Canada, Broad Cove, NL	
TC File No.:	NEATS: 41441	
NPP File No.:	2016-200006	
Environmental Review Decision:	Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project is not likely to cause significant adverse environmental effects and, as such, Transport Canada may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part.	
Reviewed by:	Melissa Ginn Environmental Officer Environmental and Indigenous Affairs	
Signature:		Date: March 8, 2016
Mailing Address:	10 Barter's Hill, St. John', NL	
Tel:	709-772-3088	
Fax:	709-772-3072	
Email:	melissa.ginn@tc.gc.ca	
Recommended by:	J. Jason Flanagan Senior Environmental Assessment Officer Environmental and Indigenous Affairs	
Signature:		Date: March 8, 2016
Approved by:	Kevin LeBlanc Regional Manager Environmental and Indigenous Affairs	
Signature:		Date: March 11, 2016





17. ATTACHMENTS

Attachment #1: Specialist advice provided by Environment Canada

Attachment #2: Lead Paint Analytical Results

Attachment #3: Transport Canada Navigation Protection Act Approval

18. NATIONAL IMPACT ASSESSMENT TRACKING SYSTEM

☒ Project registered in [tracking system](#)

☐ Not yet registered (*CEAA 2012 requires PCA submit a report to Parliament annually. EIAs must be entered in the tracking system **by the end of April** to enable reporting.*

*****Ensure that all required mitigation measures and conditions (e.g., follow-up monitoring requirements) are included in project permits and authorizations*****

REFERENCE LIST

Brouillet, L., R. Charest, S. G. Hay & A. Bouchard. 1997. Floristic analysis of the rare plants of Terra Nova National Park, Newfoundland. Contract # 2242-96-0010, Natural Resources Division, Parks Canada, Hull, Qc.

ChemInfo Services Inc. (ChemInfo). 2005. Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities. Prepared for Environment Canada, Transboundary Issues Branch. 58 pp.

The Cornell Lab of Ornithology (Cornell). 2015a. All About Birds; Common Goldeneye. https://www.allaboutbirds.org/guide/Common_Goldeneye/lifehistory.

The Cornell Lab of Ornithology (Cornell). 2015b. All About Birds; Common Merganser. https://www.allaboutbirds.org/guide/Common_Merganser/id.

Ducks Unlimited. 2016. Common Merganser. <http://www.ducks.org/hunting/waterfowl-id/common-merganser#ad-image-0>.

Fisheries and Oceans Canada (DFO). 2015. 2015-2016 Angler's Guide, Newfoundland and Labrador. www.nfl.dfo-mpo.gc.ca

Endangered Species Act. SNL2201 Chapter E-10.1. 2004 cL-3.1 s27; 2004 c36 s11.

Environment Canada. 2003. Canadian Wildlife Federation, Hinterland Who's Who, Canada Goose. <http://www.hww.ca/en/wildlife/birds/canada-goose.html>

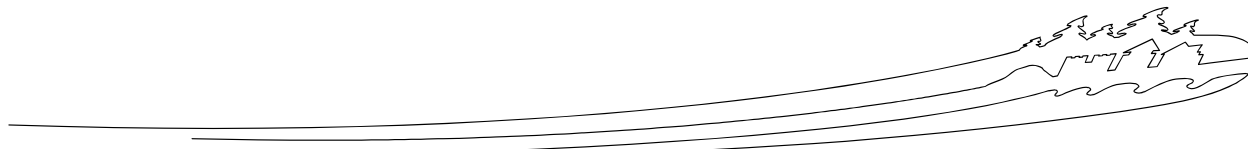
Environment Canada. 2013. Population Status of Migratory Game Birds in Canada. <http://www.ec.gc.ca/rcom-mbhr/default.asp?lang=En&n=B2A654BC-1>.

Environment Canada. 2014. Terra Nova Migratory Bird Sanctuary. <https://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=CB30D21D-1>. Accessed February 1, 2016.

Environment Canada. 2015. Environment and Climate Change Canada, Canada Geese. <https://www.ec.gc.ca/mbc-com/default.asp?lang=en&n=98A918B1-1>. Accessed February 5, 2016.

Environment Canada. 2016. Canadian Wildlife Federation, Hinterland Who's Who, American Black Duck. <http://www.hww.ca/en/wildlife/birds/american-black-duck-1-2.html>.

Government of Canada. 2016a. Migratory Bird Sanctuary Regulations. http://laws-lois.justice.gc.ca/PDF/C.R.C.,_c._1036.pdf. Accessed February 1, 2016.





Government of Canada. 2016b. Migratory Birds Convention Act, 1994. <http://laws-lois.justice.gc.ca/PDF/M-7.01.pdf>. Accessed February 1, 2016.

Hedderson, T. A. 1987. The mosses of Terra Nova National Park, eastern Newfoundland; a bio-floristic analysis and interpretation. MSc. Thesis, Memorial University of Newfoundland.

Karim, N. 2003. Roadside Floristic Patterns and Re-vegetation by Using Native Plants in Terra Nova National Park, Newfoundland, Canada, Thesis. 87 pp.

Migratory Birds Convention Act, S.C. 1994, c. 22.

Migratory Bird Sanctuary Regulations. C.R.C., c. 1036.

Newfoundland Department of Forest Resources and Agrifoods (NDFRA). 1998. Environmental Protection Guidelines for Ecologically Based Forest Resource Management (Stand Level Operations).

Newfoundland and Labrador Department of Environment and Conservation (NDOEC). 2016. Canada Goose. http://www.env.gov.nl.ca/env/snp/programs/education/animal_facts/mammals/canada_goose.html.

Newfoundland and Labrador Department of Environment and Conservation (NDOEC), Water Resources Management Division, 1997. Chapter 13, Environmental Guidelines for General Construction Practices. p18.

Parks Canada, 1977. A Biophysical Classification for Terra Nova national Park. Gauthier. 6 vols. Poulin & Theriault Ltd., Montreal, Quebec.

Parks Canada, 1984. In: Deichmann, K.H., Baradshaaw, D.B. (Eds.), Resources Description and Evaluation (RD & E) of Terra Nova National Park, 300 pp.

Parks Canada. 2009. Terra Nova Park Management Plan. <http://www.pc.gc.ca/eng/pn-np/nl/terranova/plan.aspx>

Parks Canada. 2015. Cultural Resource Values Statement – Terra Nova National Park, 21 pp

Porter, T.R., L.G. Riche and G.R. Traverse. 1974. Catalogue of Rivers in Insular Newfoundland. Vol. A. Resources Dev. Br., Fish. And Mar. Serv., Dept Env. Data Record Series No. New/D-74-9. 277 pp.

Species at Risk Act, S.C. 2002, c. 29.

Wolkowski, R. and B. Lowery (2008). Soil compaction: Causes, concerns and cures. Cooperative extension Publishing, Madison.

Yetman, D., Hermanutz, L., and Stroud, G. 1999. Epiphytic lichen diversity and abundance based on forest in Terra Nova National Park, Memorial University of Newfoundland, St. John's, Newfoundland.

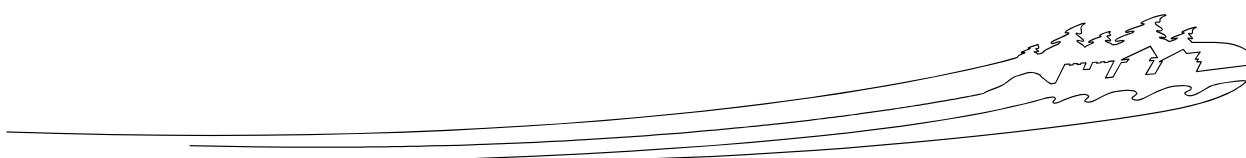




Appendix 1 Environmental Impact Analysis Tools: Effects Identification Matrix

Section A focuses on direct effects of the project and **Section B** on indirect effects that are caused by changes to the environment.

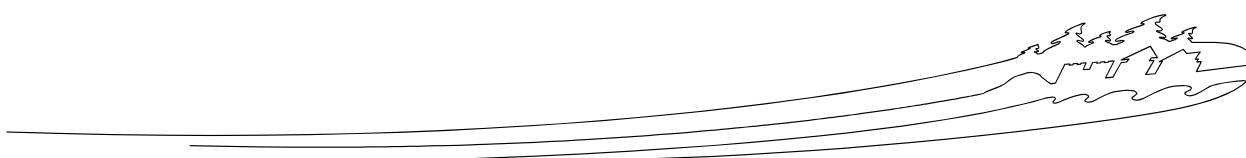
A. Direct Effects (during preparation/construction phases)													
			Components potentially directly affected by the proposed project										
			Natural Resources					Cultural Resources		Visitor Experience			
			Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Archaeological Resources (Sites and	Landscape Features	Visitor access & services	Recreational/Accommodation opportunities	Views and soundscapes	Visitor Safety
Project Components	Phase	Examples of Associated Activities											
Preparation / construction		Supply and storage of materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Clearing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Demolition	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Disposal of waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Blasting/Drilling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Dredging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Drainage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Excavation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Grading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Backfilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of machinery	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Transport of materials/equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Building of fire breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Set up of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





A. Direct effects continued (during operation/implementation/decommissioning phases)

		Components potentially affected by the proposed project											
		Natural Resources						Cultural Resources	Visitor Experience				
		Air	Soil & landforms	Water (surface, ground, crossings, etc.)	Flora (specify, including SAR)	Fauna (specify, including SAR)	Archaeological Resources (Sites and	Landscape Features	Visitor access &	Recreational & Accommodations	Views and soundscapes	Visitor Safety	Essence of place
Project Components	Phase	Examples of Associated Activities											
	Operation/Implementation/Decommissioning	Waste disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Wastewater disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use/Removal of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Active fire stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Prescribed burn cleanup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Planting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Culling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Vehicle Traffic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

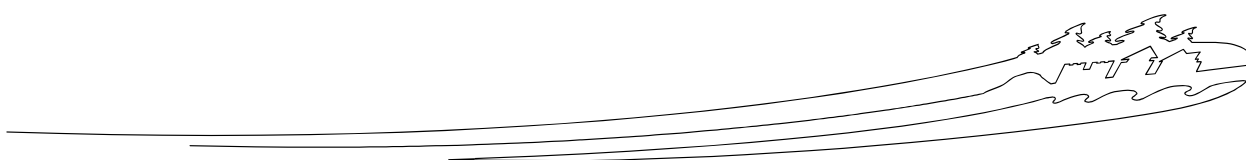




Section B of the matrix should be used to identify potential indirect effects that may result from impacts of the project to components of the environment you have identified on the preceding pages (see Section A - direct effects to natural resources). Consideration of indirect effects is required under CEAA 2012 Sections 5(1)(c) and 5(2)(b), and by the PCA mandate. For example:

- if the proposed project could lead to adverse effects to water quality and quantity, could this then effect the quantity and quality of water resources (e.g., potable water) used by an Aboriginal community?
- could there also be adverse socio-economic effects to a community that relies on recreational fishing tourism?
- could changes to the environment (e.g., digging, clearing) affect visitor access, opportunities, or safety?

B. Indirect Effects (all phases)							
<p>You may wish to change the components listed under the headings to specify the natural or resources that are priority considerations for your PCA site or for the specific project being reviewed.</p>		Impacts as a result of changes to the environment					
		With respect to non-Aboriginal peoples:	With respect to Aboriginal peoples:		With respect to visitor experience		
		Health and socio-economic conditions	Health & socio-economic conditions	Current use of lands and resources for traditional purposes	Access & services	Recreation & accommod'n opportunities	Safety
Phase	Natural resource components affected by the project						
Preparation /construction operation/implementation/decommissioning	Could impacts to <u>air</u> lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>soils</u> and landforms lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>water</u> (e.g., surface, ground water and water crossings) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>flora</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Could impacts to <u>fauna</u> (including SAR) lead to adverse effects on...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

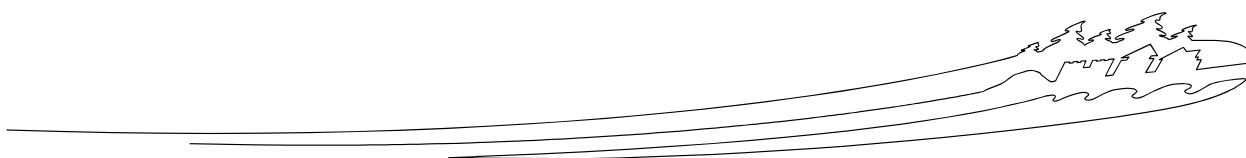




Appendix 2: SARA-Compliant Authorization Decision Tool

- **This tool is for use when the BIA has determined that project activities will lead to residual adverse effects to THR, EN, or EX species at risk** (i.e., even after mitigation measures are applied, there are effects to individuals, residences or critical habitat of THR, EN or EX species at risk).
- This tool provides a structured process to determine if a SARA authorization is required, if it can be issued, and how to issue it.
- **Guidance for each question is provided within the form and should be deleted from the final version.**
- Consultation with a representative of the [Species Conservation and Management \(SCM\)](#) team is encouraged to help ensure consistent application of this tool.

Part A – Does a SARA authorization need to be considered for this activity?
1. Will the activity lead to residual adverse effects that contravene a SARA prohibition for a listed endangered (En), threatened (Th) or extirpated (Ex) species at risk, its residence or its critical habitat? (Clearly indicate if the activity will affect one/or more listed species).
SARA prohibitions: s.32 - Cannot: kill, harm, harass, capture, or take individuals; possess, collect, buy, sell or trade individuals or parts of individuals; s.33 – Cannot damage or destroy residences; s.58 – Cannot destroy any part of critical habitat; s.80 - Cannot carry out an activity that is prohibited under a protection order.
<input type="checkbox"/> Yes. Residual adverse effects of the activity will contravene a SARA prohibition. Document how activities will contravene a SARA prohibition. Then continue to Question 2.
2. Is the activity authorized under S. 83 of SARA?
<input type="checkbox"/> Yes. A SARA authorization is NOT required. The activity is authorized in a recovery strategy or action plan; OR <input type="checkbox"/> Yes. A SARA authorization is NOT required. The activity is required for public safety, health or national security AND authorized by or under another Act of Parliament. <u>Document below:</u> <ul style="list-style-type: none">• The specific section of the published recovery strategy or action plan that makes reference to section 83 of SARA OR <ul style="list-style-type: none">• Why the activity is needed for public safety, health or national security and reference the Act of Parliament under which the activity is authorized (you MUST consult a member of the SCM team if you plan to use the section 83 exception). If all activities that would contravene a SARA prohibition are already authorized under SARA s.83, check the first box in Part D and submit for approval.
<input type="checkbox"/> No. A SARA authorization is required. Continue to Part B.





Part B – Is the activity eligible for authorization under SARA?

****Complete ONLY if you have answered **NO** to Question 2, above****

3. Does the activity fall into one of the following three categories?

Select the appropriate box (check only one) and **continue to Question 4** OR, If the proposed activity DOES NOT fit in any of the three categories below the activity CANNOT be authorized, and you can check the second box in **Part D** and **submit for approval**.

- ☐ The activity is scientific research related to the conservation of the species and conducted by qualified persons; **OR**
- ☐ The activity benefits the species or is required to enhance its chance of survival in the wild ; **OR**
- ☐ Affecting the species is incidental to the activity (i.e., the purpose of the activity is not to engage in an activity that is prohibited under SARA (e.g., kill, harm, harass an individual; destroy a residence or critical habitat). For example, fishing for a listed species cannot be permitted, but accidental by-catch *may* be.

4. Alternatives that would reduce the impact(s) on the species have been considered and the best solution adopted

Document below and **continue to Question 5**. *This question is an additional requirement to the questions in the BIA template.*

- Identify and explain all reasonable alternatives considered to reduce the impact(s) on the species (alternatives to the project and alternative means of carrying out the project, including a “no action” alternative).
- This explanation must demonstrate that the best solution has been adopted.

5. All feasible measures must be taken to minimize the impact of the activity

Ensure that the mitigations identified in Section 8 of the BIA template to address effects to species at risk are as comprehensive as possible, and continue to **Question 6**.

6. Will the activity jeopardize the survival or recovery of the species?

Document here your analysis of whether the activity will jeopardize survival or recovery of the species. The analysis must consider and refer to relevant SARA recovery documents (e.g., COSEWIC status reports, recovery strategies, action plans), and/or Parks Canada Detailed Assessments for the species, if available. In particular, refer to the population and distribution objectives, the threats to the species, and the identification of critical habitat (including the location, amount - if available, biophysical attributes, and the activities likely to destroy).

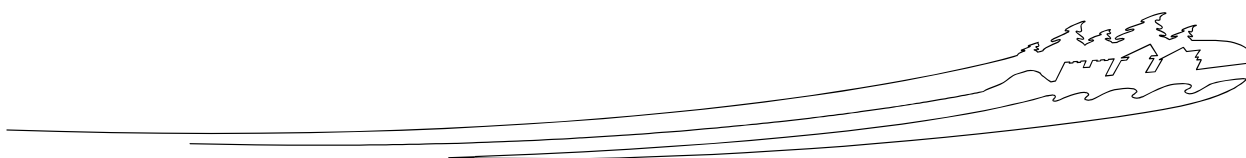
NOTE: *If the BIA determines there are no alternatives or mitigation measures that can prevent destruction of critical habitat or non-compliance with a protection order, you **MUST** consult a member of the [SCM team](#) for further advice.*

- ☐ **Yes. The activity CANNOT be authorized.**

Check analysis with the [SCM team](#). Then check the second box in **Part D** and **submit for approval**. **ENSURE THIS CONCLUSION IS TAKEN INTO CONSIDERATION IN SECTION 10 OF THE BIA TEMPLATE (SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS) AND DOCUMENTED IN THE BIA TEMPLATE, SECTION 15 – DECISION.**

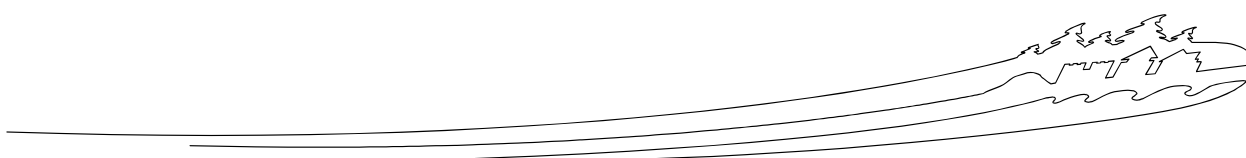
- ☐ **No. The activity CAN be authorized.** Complete explanation and continue to **Part C**.

Clearly document how you considered potential jeopardy to the survival or recovery of the species. Check analysis with the [SCM team](#).





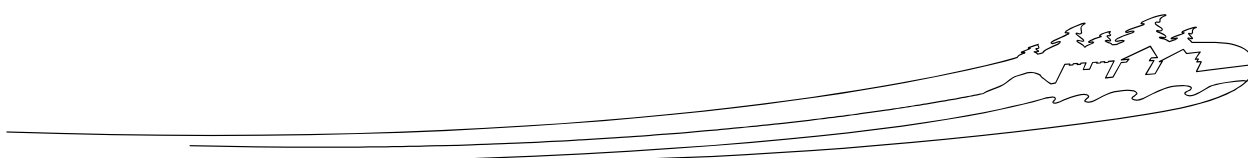
Part C - Prepare the SARA authorization and posting explanation
7. Prepare the authorization
The authorization will be issued using the EIA process and SARA s.74
Issue the SARA authorization using the template on the intranet and complete Question 8 to prepare the posting for the SAR Public Registry .
8. Provide description for posting
<i>SARA requires that an explanation of why a SARA authorization is issued be posted in the SARA Public Registry in both official languages within 30 days of the authorization being issued. Prepare the explanation, using the information you entered in the BIA and previous sections of this Appendix. Your regional SCM representative will have the explanation translated and will publish it on the SARA registry.</i>
Regional or Local Number: <i>Provide the authorization number issued by Parks Canada (in this instance, the file number of the EIA)</i>
Purpose – select the answer indicated in Section 3 of this Appendix: ➤ Affecting the species is incidental to the activity; OR ➤ The activity is necessary of beneficial to the species, OR ➤ The activity is scientific research related to the conservation of the species and conducted by qualified persons
Description of the Activity <i>Provide a one-paragraph summary of the activity and how it will affect the listed species (using the information in sections 5 & 10 of the BIA template)</i> ➤ Start Date of Authorization: XXX End Date of Authorization: XXX ➤ Issuing Authority: Parks Canada Agency ➤ Authority Used: (see section 7 of this Appendix) ➤ Location of Activity (province, territory or ocean): XXX ➤ Affected Species: <i>Limit your list to potentially affected species that are listed under SARA as Extirpated, Endangered or Threatened</i>
Pre-Conditions - limit your explanation to species for which the authorization will be issued: <i>Provide a half-page summary of proposed mitigation measures and the significance of residual effects (from the BIA) and provide summary of sections 4, 5 and 6 of this Appendix.</i>
Contact Person(s) <i>Provide name and coordinates of a PCA contact.</i>





Part D – SARA Authorization Decision
Select the appropriate answer and continue to Part E.
<input type="checkbox"/> This activity does not require a SARA authorization, as indicated in Questions 1 and 2.
<input type="checkbox"/> This activity requires a SARA authorization but CANNOT be authorized because it does not fit into one of the three required categories (see response to Question 3) OR it does not meet one of the SARA pre-conditions (see responses to Questions 4-6).
<p>This activity meets the SARA authorization requirements; an authorization may be issued (see response to Questions 3-6). The residual adverse effects (effects remaining after mitigations have been applied) MAY contravene the following SARA prohibition:</p> <p><input type="checkbox"/> s.32 - Cannot: kill, harm, harass, capture, or take individuals; possess, collect, buy, sell or trade individuals or parts of individuals;</p> <p><input type="checkbox"/> s.33 – Cannot damage or destroy residences;</p> <p><input type="checkbox"/> s.58 – Cannot destroy any part of critical habitat;</p> <p><input type="checkbox"/> s.80 - Cannot carry out an activity that is prohibited under a protection order</p>

Part E – SARA Authorization Recommendation and Approval	
Prepared by (<i>add additional blocks as required</i>): Name & Position of Author(s), Collaborator(s), Reviewer(s):	Date: YYYY-MM-DD
Recommended by: Name & Position:	Date: YYYY-MM-DD
Decision Approval	
Name & Position (<i>FUS/Director of a Waterway, or Delegate</i>):	
Signature:	Date: YYYY-MM-DD





Attachment #1

Environment Canada Specialist/Expert Advice

For

Broad Cove Bridge Reconstruction

Basic Impact Analysis

Terra Nova National Park of Canada

Newfoundland and Labrador

March 2016



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Environmental Stewardship Branch
6 Bruce Street
Mount Pearl, NL A1N 4T3

7 March 2016

Mark McNeil
Environmental Services
Public Works and Government Services Canada
Suite 204, 1 Regent Square
Corner Brook, NL A2H 7K6

Dear Mr. McNeil:

RE: Broad Cove Bridge demolition and reconstruction, Terra Nova National Park of Canada, NL EAS 2016-009

As requested in your email of 5 February 2016, Environment and Climate Change Canada (ECCC) has reviewed the project description for the above-noted project. Please note that our review comments, in areas related to ECCC's mandate, are provided to support your environmental management process for this project.

It is understood that Parks Canada decided in 2015 to replace the Broad Cove Bridge (Route 310 in Terra Nova National Park, NL) excluding abutments, as a result of numerous deficiencies within the structure. The current deck will be removed and replaced.

ECCC has specialist knowledge and information relevant to the proposed project that stems from our mandate as set out in various statutes including the *Migratory Birds Convention Act (MBCA)*, *Canadian Environmental Protection Act*, *Canada Water Act*, *Canada Wildlife Act*, *Species at Risk Act*, *Department of Environment Act*, and the *Fisheries Act* (Section 36). ECCC is also the lead federal department in promoting a variety of federal policies and programs concerning the environment.

REVIEW COMMENTS

Regulatory Requirements

Fisheries Act

Pollution prevention and control provisions of the *Fisheries Act* are administered and enforced by Environment Canada. The deposit of a deleterious substance to water frequented by fish may constitute a violation of the *Fisheries Act*, whether or not the water itself is made deleterious by the deposit. Subsection 36(3) of the *Fisheries Act* prohibits anyone from depositing or permitting the deposit of a deleterious substance of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. The notion of a deleterious substance applies both to fish and to fish habitat.

It is the responsibility of the proponent to ensure that all reasonable measures are conducted to prevent the release of substances deleterious to fish from their proposed activities. In general, compliance is determined at the last point of control of the substance before it enters waters

frequented by fish, or, in any place under any conditions where a substance may enter such waters.

Migratory Birds Convention Act

Migratory birds, their eggs, nests, and young are protected under the *Migratory Birds Convention Act* (MBCA). Migratory birds protected by the MBCA generally include all seabirds except cormorants and pelicans, all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles). Most of these birds are specifically named in the Environment Canada (EC) publication, *Birds Protected in Canada under the Migratory Birds Convention Act*, Canadian Wildlife Service Occasional Paper No. 1.

Under Section 6 of the *Migratory Birds Regulations* (MBR), 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. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities.

Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

“5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds.”

It is the responsibility of the proponent to ensure that activities are managed so as to ensure compliance with the MBCA and associated regulations.

Canadian Environmental Protection Act

The proponent should also be aware of the potential applicability of the *Canadian Environmental Protection Act* (CEPA 1999). CEPA 1999 enables protection of the environment, and human life and health, through the establishment of environmental quality objectives, guidelines and codes of practice, and the regulation of toxic substances, emissions and discharges from federal facilities, international air pollution, and disposal at sea.

Under CEPA 1999 a substance is considered toxic if it is entering or may enter the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity, constitute or may constitute a danger to the environment on which life depends; constitute or may constitute a danger in Canada to human life or health.

Migratory Birds and Species at Risk

The Canadian Wildlife Service of Environment Canada (EC-CWS) has reviewed the above project and offers the following comments:

- Vegetation Clearing
Clearing vegetation may cause disturbance to migratory birds, and may inadvertently cause the destruction of their nests and eggs. Many species use trees, as well as brush, deadfalls and other low-lying vegetation for nesting, feeding, shelter and cover. This would apply to songbirds throughout the region, as well as waterfowl in wetland areas. Disturbance of this nature would be most critical during

the breeding period. The breeding season for most birds within the project area occurs between April 15th and August 15st in this region, however some species protected under the MBCA do nest outside of this time period. Please see the webpage “General Nesting Periods of Migratory Birds in Canada” (Website: <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1>) for more specific information concerning the breeding times of migratory birds. This project area falls within zone “D3-4”.

Environment and Climate Change Canada provides the following recommendations:

1. to avoid the risk of nest destruction, the proponent should avoid vegetation clearing and field burning during the most critical period of the migratory bird breeding season (see above).
 2. to develop and implement a management plan that includes appropriate preventive measures to minimize the risk of impacts on migratory birds (See “Planning ahead to reduce risks to migratory bird nests”, PDF: <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=50C4FE11-801E-4FE3-8019-B2D8537D76CF>). It is the responsibility of the individual or company undertaking the activities to determine these measures. For guidance on how to avoid the incidental take of migratory birds nests and eggs, please refer to the Avoidance Guidelines (Website: <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=AB36A082-1>). The management plan should include processes to follow should an active nest be found at any time of the year.
- Migratory Bird Sanctuary Regulations
Proposed activities do not contravene the Migratory Bird Sanctuary Regulations and no permit will be required.
 - Bridges – Nesting Birds
Migratory birds (e.g. Barn Swallows, Cliff Swallows, Eastern Phoebe) may nest on bridge structures. ECCC-CWS recommends avoidance of potentially destructive decommissioning activities and bridge maintenance activities (e.g. cleaning, application and removal of protective coatings) during the avian breeding season (see “Vegetation Clearing” for information on breeding season) on bridges where migratory birds are known to nest.
 - Bridges – Open Water
Open areas of water under bridges are often used by a variety of waterbirds (e.g. mergansers, goldeneye) in winter. It should be determined if waterbirds in the area use ice-free water beneath the bridge in the winter. This information may be available from birders from local naturalist clubs or from park staff. It should be determined if the amount of ice free area would be modified by construction of the new bridge. If open water areas are limiting in the area, construction activities are advised to be completed prior to the formation of ice elsewhere in the area.
 - Stockpiles
Certain species of migratory birds (e.g. Bank Swallows) may nest in large piles of soil left unattended/unvegetated during the most critical period of breeding season (April 25th through August 15th). To discourage this, the proponent should consider measures to cover or to deter birds from these large piles of unattended soil during the breeding season. If migratory birds take up occupancy of these piles, any industrial activities (including hydroseeding) will cause disturbance to these migratory birds and inadvertently cause the destruction of nests and eggs. Alternate measures will then need to be

taken to reduce potential for erosion, and to ensure that nests are protected until chicks have fledged and left the area. For a species such as the Bank Swallow, the period when the nests would be considered active would include not only the time when birds are incubating eggs or taking care of flightless chicks, but also a period of time after chicks have learned to fly, because Bank Swallows return to their colony to roost.

- Invasive Species

Measures to diminish the risk of introducing invasive species should be developed and implemented during all project phases. These measures could include:

- Cleaning and inspecting construction equipment prior to transport from elsewhere to ensure that no vegetative matter is attached to the machinery (e.g., use of pressure water hose to clean vehicles prior to transport)
- Regularly inspecting equipment prior to, during and immediately following construction in areas found to support Purple Loosestrife to ensure that vegetative matter is not transported from one construction area to another.

- Light Attraction and Migratory Birds

Attraction to lights at night or in poor visibility conditions during the day may result in collision with lit structures or their support structures, or with other migratory birds. Disoriented migratory birds are prone to circling light sources and may deplete their energy reserves and either die of exhaustion or be forced to land where they are at risk of depredation.

To reduce risk of incidental take of migratory birds related to human-induced light, ECCC-CWS recommends implementation of the following beneficial management practices:

- The minimum amount of pilot warning and obstruction avoidance lighting should be used on tall structures. Warning lights should flash, and should completely turn off between flashes.
- The fewest number of site-illuminating lights possible should be used in the project area. Only strobe lights should be used at night, at the lowest intensity and smallest number of flashes per minute allowable by Transport Canada.
- Lighting for the safety of the employees should be shielded to shine down and only to where it is needed.
- LED lights should be used instead of other types of lights where possible. LED light fixtures are less prone to light trespass (i.e. are better at directing light where it needs to be, and do not bleed light into the surrounding area), and this property reduces the incidence of migratory bird attraction.

- Coastal Infrastructure

ECCC-CWS advises the following recommended beneficial management practices for working on shorelines:

- Staff, contractors and visitors should not approach concentrations of seabirds, sea ducks or shorebirds.
- All vessels should use the main navigation channels to get to and from the site, and should have well muffled machinery.
- Staff and contractors should undertake any measures that may minimize or eliminate discharge of oily waste into the marine environment.
- Food scraps and other garbage left on beaches and other coastal habitats can artificially enhance the populations of avian and mammalian predators of eggs and chicks. The proponent should ensure that no litter (including food waste) is left in coastal areas by their staff and/or contractors
- If there is any noticeable change in seabird numbers or distribution at the location during operations, ECCC-CWS should be notified.

Species at Risk

The proponent should also be reminded that the prohibitions under the *Species at Risk Act* (SARA) are in force. The complete text of SARA, including prohibitions, is available at <http://laws-lois.justice.gc.ca/eng/acts/s-15.3/index.html>.

It should be noted that Section 79 of the *Species at Risk Act* states:

79. (1) Every person who is required by or under an Act of Parliament to ensure that an assessment of the environmental effects of a project is conducted, and every authority who makes a determination under paragraph 67(a) or (b) of the *Canadian Environmental Assessment Act, 2012* in relation to a project, must, without delay, notify the competent minister or ministers in writing of the project if it is likely to affect a listed wildlife species or its critical habitat.

(2) The person must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans.

The following species at risk (as listed on Schedule 1 of the *Species at Risk Act*) may occur within the study area: Olive-sided flycatcher (Threatened), and Red Crossbill (*Percna* subspecies, Endangered). Though unlikely to be found within the project footprint, these species may occur within the study area and we request that sightings be reported to ECCC-CWS. Recovery Strategies and Management Plans for SARA-listed species can be obtained at <http://www.sararegistry.gc.ca>.

Wetlands

The proponent should be aware that as part of its commitment to wetlands conservation, the Federal Government has adopted *The Federal Policy on Wetland Conservation* (FPWC) with its objective to “promote the conservation of Canada’s wetlands to sustain their ecological and socio-economic functions, now and in the future.” In support of this objective, the Federal Government strives for the goal of No Net Loss of wetland function on federal lands or when federal funding is provided.

The FPWC is applicable to any Federal Departments exercising a power, duty, or function that would permit the carrying out of the project or associated activities. The policy recognizes the importance of wetlands to the environment, the economy and human health, and promotes a goal of no-net-loss of wetland functions. In support of this goal, the FPWC and related implementation guidance identify the importance of planning, siting and designing a project in a manner that accommodates a consideration of mitigation options in a hierarchical sequence - avoidance, minimization, and as a last resort, compensation. The goals of the FPWC should be considered by the federal agencies who may be providing funding, who may have land management responsibilities for federal lands implicated by the project, or who may be issuing permits that would allow effects on wetlands.

A copy of the FPWC can be found at: <http://publications.gc.ca/pub?id=9.686114&sl=0>.

ECCC-CWS recommends using a 30 meter buffer from the high water mark of any water body (1:100 year Flood Zone) in order to maintain movement corridors for migratory birds. Please see <https://www.ec.gc.ca/paom->

itmb/default.asp?lang=En&n=8D910CAC-1#_03_1_1 for further information concerning buffer zones.

In order to promote wetland conservation, ECCC-CWS recommends the following:

- Developments on wetlands should be avoided.
- Where development does occur in the vicinity of wetlands, a minimum vegetation buffer zone of 30 meters should be maintained around existing wetland areas.
- Hydrologic function of the wetland should be maintained.
- Runoff from development should be directed away from wetlands.

Fuel Leaks

The Canadian Wildlife Service of Environment Canada recommends that the proponent adhere to best practices with regard to fuelling and servicing equipment, using biodegradable fluids, fuel spills and spill contingency plans, to protect migratory birds and their habitats (described in more detail under ***Management of Hazardous Materials and Waste***). Furthermore, the proponent should ensure that contractors are aware that under the *Migratory Birds Regulations*, “no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.”

On-land Disposal and Site Disturbance

In general, impacts related to on-land disturbance should be designed so as to:

- place a priority on pollution prevention;
- facilitate compliance with the general prohibition against the deposit of a deleterious substance into waters frequented by fish (Section 36 of the *Fisheries Act*); and
- respect applicable Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines.

Construction

At the project planning stage, all available construction materials should be considered (e.g., untreated wood, treated wood, pre-cast concrete, corrosive-resistant steel, plastic lumber), and those materials best suited to the conditions and intended use of the structure should be selected. Analysis of the preferred construction material should include a consideration of the full life-cycle of the material (ease of use, design factors associated with the construction material, maintenance requirements, and final disposal). Environmental implications (e.g. storm and ice damage) associated with each life-cycle phase should also be considered. For example, it may not be cost effective to use pressure treated wood for a coastal structure that may be destroyed or damaged by storm surge during the life expectancy of the structure.

Pressure Treated Wood

The long-term impacts of pressure treated wood in aquatic environments remains uncertain, and therefore, EC urges that a precautionary approach be taken. If pressure treated wood (e.g. Chromated Copper Arsenate [CCA]) is determined to be the most suitable material for the project, the proponent is encouraged to incorporate the following standards into the planning and management of construction activities:

- the product should be approved for use by Health Canada's Pest Management Regulatory Agency, which sets out use limitations for all treated wood products under the *Pest Control Products Act*,

- only wood treated according to the 2006 industry publication entitled “Best Management Practices for the Use of Treated Wood in Aquatic and Other Sensitive Environments” should be used (this report and its 2006 amendment and 2007 addendum are available at <http://www.WWPInstitute.org/>). These BMPs ensure that surface pesticide residual is minimized and only small amounts of pesticide are released over the life span of the structure;
- only proper construction techniques should be used (e.g. keep as much of the product above the high water mark as possible, capture sawdust to avoid entry into water bodies);
- the use of pressure treated wood in *freshwater* environments is discouraged; and,
- according to Hutton and Samis (2000), the use limitation restriction for Ammoniacal Copper Quaternary (ACQ) treated wood does not allow its use in aquatic environments when submerged (this report is available online at <http://www.dfo-mpo.gc.ca/Library/245973.pdf>); however, it can be used for above-water applications such as decking.

Concrete Production

Discharges from project work involving the use of concrete, cement, mortars and other Portland cement or lime-containing construction materials may have a high pH, and work should be planned and conducted to ensure that sediments, debris, concrete, and concrete fines are not deposited, either directly or indirectly into the aquatic environment. Any potentially contaminated water (e.g. exposed aggregate wash-off, wet curing, equipment and truck washing), should be prevented from entering the aquatic environment unless it can be confirmed that this water will not be deleterious to fish or harmful to migratory birds. Containment facilities should be provided at the site as required.

Suspension of Sediments

From the brief project description provided, it is not clear whether there will be in-water activities. The disturbance of substrate during in-water activities increases sediment concentrations and turbidity in the water column. This disturbance may alter light penetration, temperature and water chemistry regimes, and may affect photosynthesis. The CCME (Canadian Council of Ministers of the Environment) *Canadian Environmental Quality Guidelines* (1999) recommend that, for protection of marine waters, human activities should not cause suspended solids levels to increase by more than 10% of the natural conditions expected at the time. The guidelines also recommend that no solid debris, including floating or drifting materials or settleable matter, be introduced into marine and estuarine waters.

Management of Hazardous Materials and Waste

In order to ensure compliance with Section 36 (3) of the *Fisheries Act* and with the *Migratory Birds Convention Act* and related Regulations, provisions for the management of hazardous materials (e.g. fuels, lubricants) and wastes (e.g. contaminated soil, sediments, waste oil) should be identified and implemented so as to ensure the risk of chronic and accidental releases is minimized. Additionally, the following mitigation recommendations are made with respect to the transport, storage, use and disposal of petroleum products and toxic substances which, when employed, may minimize impacts to nearby receiving waters:

- Even small spills of oil can have very serious effects on migratory birds and fish. Therefore, every effort should be taken to ensure that no oil spills occur in the area. Refuelling and maintenance activities should be undertaken on level terrain, at least 30m from any surface water (including shorelines), on a prepared impermeable surface with a collection system to ensure oil, gasoline and hydraulic fluids do not enter surface waters. Waste oil should be disposed of in an approved manner.
- Biodegradable alternatives to petroleum-based hydraulic fluid for heavy machinery and chainsaw bar oil are commonly available from major manufacturers. Such biodegradable fluids

should be considered for use in place of petroleum products whenever possible, as a standard for best practices.

- Drums of petroleum products or chemicals should be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry, water-tight building or shed with an impermeable floor.
- In order to ensure that a quick and effective response to a spill event is possible, spill response equipment should be readily available on-site. Response equipment, such as adsorbents and open-ended barrels for collection of cleanup debris, should be stored in an accessible location on-site. Personnel working on the project should be knowledgeable about response procedures. The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event. The proponent should indicate how the contingency plans will be prepared, and response measures implemented, to reflect site-specific conditions and sensitivities. In developing a contingency plan, it is recommended that the Canadian Standards Association publication Emergency Planning for Industry CAN/CSA-Z731-03, be consulted as a useful reference.
- The proponent should report any spills of petroleum or other hazardous materials to the Environmental Emergencies 24 Hour Report Line (St. John's 709-772-2083; other areas 1-800-563-9089).

Effects of the Environment on the Project

Because the proposed project will be sensitive to climate and weather, particularly extreme events, mitigative measures should be factored into the design to ensure that the risk of infrastructure and environmental damage and other accidents is minimized. Historical data, local area knowledge and increasing ranges of weather events (e.g. Hurricane Igor) should be taken into account in determining the adequacy of the building design.

Climatological data to assess the effects of the environment on the project can be obtained at <http://www.climate.weatheroffice.ec.gc.ca/>. Value-added data can be obtained by consulting ECCC's Atlantic Climate Centre at (506) 451-6006 or by email at: climate.atlantic@ec.gc.ca.

The proponent is also encouraged to regularly consult ECCC's local forecast at <http://www.weatheroffice.ec.gc.ca/> so that construction-related activities can be scheduled accordingly.

I trust that this information will be of assistance in your review of this project. If you wish to discuss these comments or have further questions, please do not hesitate to contact me at 709-772-4313 or via email at jerry.pulchan@ec.gc.ca at your convenience.

Yours truly,



Jerry Pulchan
Environmental Assessment Analyst
Environmental Protection Operations Directorate- Atlantic

Cc: M. Hingston



Attachment #2

Lead Paint Analytical Results

For

Broad Cove Bridge Reconstruction

Basic Impact Analysis

Terra Nova National Park of Canada

Newfoundland and Labrador

March 2016



March 4, 2016

Ms. Lisa Grasse
Crandall Engineering Ltd.
1077 St. George Boulevard
Moncton, NB E1E 2C9

Dear Ms. Grasse,

Re: Paint Sampling
Terra Nova National Park - Newfoundland and Labrador

Thank you for retaining Strum Consulting to complete paint sampling at Terra Nova National Park in Newfoundland and Labrador.

In August 2015, six paint samples were collected from steel beams of the bridge located on Highway 310 near Broad Cove within Terra Nova National Park. The samples were submitted to Maxxam Analytics laboratory in Bedford, NS for analysis of extractable arsenic, lead, and mercury. As shown in Table 1 (attached), three of the six samples collected reported lead concentrations that exceed the maximum allowable concentration of lead (1000 mg/kg) for disposal purposes at the Robin Hood Bay Waste Management Facility in St. John's, NL.

As per the Robin Hood Bay Waste Management Facility Certificate of Approval, if the average of the extractable concentrations of lead exceeds 1000 mg/kg, the leachate characteristics of the material must be evaluated to determine leachable lead. If the leachate analysis indicates a leachate concentration of less than 5 mg/L of lead, the material may be disposed of at the facility.

Strum returned to the site in February 2016 to collect three additional paint samples from the bridge that were submitted to Maxxam Analytics for leachable lead analysis. As shown in Table 1, the three paint samples collected in February 2016 reported leachable lead concentrations ranging from 0.027 to 0.14 mg/L. As such, the leachable lead concentrations comply with the maximum allowable lead leachate concentration (5 mg/L) as per the Robin Hood Bay Waste Management Facility Certificate of Approval.

Thank you,

Shawn Duncan, BSc.
Vice President
sduncan@strum.com

Strum Project # 15-5456

Engineering • Surveying • Environmental

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TABLE 1: Extractable Arsenic, Lead, and Mercury Analytical Results, Terra Nova National Park, NL **Project # 15-5456**

Sample ID	Units	Lead	Mercury	Arsenic
Extractable Analysis				
P1(AU27)	mg/kg	1100	nd	170
P2(AU27)	mg/kg	730	nd	130
P2(AU27) Lab- Dup	mg/kg	610	nd	140
P3(AU27)	mg/kg	2600	nd	75
P4(AU27)	mg/kg	1000	nd	62
P5(AU27)	mg/kg	32	nd	100
P6(AU27)	mg/kg	27000	nd	nd
P6(AU27) Repeat	mg/kg	24000	-	-
Lead Leachate Analysis				
P1(FE16)	mg/L	0.027	-	-
P2(FE16)	mg/L	0.062	-	-
P3(FE16)	mg/L	0.14	-	-

Notes:

nd: non-detectable concentrations

Samples collected on dates indicated

RDL : Reportable Detection Limit

Analysis by Maxxam Analytics Inc., Bedford, NS

* Sample P6(AU27) underwent additional analysis to confirm elevated lead (Pb) concentrations.

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		AWT849	AWT850	AWT850	AWT851	AWT852	AWT853	AWT854		
Sampling Date		2015/08/27	2015/08/27	2015/08/27	2015/08/27	2015/08/27	2015/08/27	2015/08/27		
COC Number		N/A	N/A	N/A	N/A	N/A	N/A	N/A		
	UNITS	P1(AU27)	P2(AU27)	P2(AU27) Lab-Dup	P3(AU27)	P4(AU27)	P5(AU27)	P6(AU27)	RDL	QC Batch

Metals										
Acid Extractable Arsenic (As)	mg/kg	170	130	140	75	62	100	ND	10	4174324
Acid Extractable Lead (Pb)	mg/kg	1100	730	610	2600	1000	32	27000	5.0	4174324
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	ND	ND	ND	ND	ND	1.0	4174324

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

ND = Not detected

Maxxam ID		AWT854		
Sampling Date		2015/08/27		
COC Number		N/A		
	UNITS	P6(AU27) REPEAT	RDL	QC Batch

Metals				
Acid Extractable Lead (Pb)	mg/kg	24000	5.0	4228541
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

ELEMENTS BY ICP/MS (PAINT)

Maxxam ID		BWL619	BWL620	BWL621		
Sampling Date		2016/02/16	2016/02/16	2016/02/16		
COC Number		N/A	N/A	N/A		
	UNITS	P1(FE16)	P2(FE16)	P3(FE16)	RDL	QC Batch
Metals						
Leachable Lead (Pb)	ug/L	27	62	140	5.0	4390859
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



Attachment #3

Transport Canada Navigation Protection Act Approval

For

Broad Cove Bridge Reconstruction

Basic Impact Analysis

Terra Nova National Park of Canada

Newfoundland and Labrador

March 2016