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Boat Harbour Remediation Project

ENVIRONMENTAL ASSESSMENT REPORT

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Executive Summary

Build Nova Scotia (the Proponent) is proposing the Boat Harbour Remediation Project (the Project) for the remediation of Boat Harbour and nearby lands, located next to Pictou Landing First Nation and five kilometres east of Pictou, Nova Scotia. In 1967, the provincial government constructed the Boat Harbour Effluent Treatment Facility to treat effluent from industrial sources and in the process, reconstructed a natural tidal estuary into a closed effluent stabilization basin. The Government of Nova Scotia closed the effluent treatment facility and as part of the remediation work, an existing on-site hazardous waste containment facility (i.e., containment cell) would be vertically expanded to increase its capacity from 220,000 cubic metres to up to 1,074,000 cubic metres (approximately 490%) for the storage of hazardous waste-bearing sediment that would be removed from the effluent treatment facility. The Proponent anticipates the Project would take between four and seven years to complete following approval.

The Impact Assessment Agency of Canada (IAAC) conducted an environmental assessment (EA) of the Project in accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) because it is described in the *Regulations Designating Physical Activities*:

> ***The expansion of an existing facility used exclusively for the treatment, incineration, disposal or recycling of hazardous waste that would result in an increase in hazardous waste input capacity of 50% or more.***

On August 28, 2019, the *Impact Assessment Act* came into force and CEAA 2012 was repealed. However, in accordance with the transitional provisions of the *Impact Assessment Act*, the EA of this Project is being continued under CEAA 2012 as if that Act had not been repealed.

The EA report (this report) summarizes the assessment conducted by IAAC, including the information and analysis on the potential environmental effects of the Project considered by IAAC in reaching its conclusions on whether the Project is likely to cause significant adverse environmental effects after taking into account the implementation of mitigation measures. IAAC prepared this report with advice from a federal review team, provincial government departments, and potentially affected Indigenous groups (i.e., the Mi'kmaq of Nova Scotia). It was also informed by technical information provided by the Proponent and comments from the public.

IAAC assessed environmental effects on areas of federal jurisdiction in relation to section 5 of CEAA 2012, including effects related to changes to the environment that are directly linked or necessarily incidental to any federal authorizations required for the Project, and the potential adverse effects of the Project on species listed in the *Species at Risk Act* (SARA) and their critical habitat. IAAC acknowledges that the purpose of the Project is to remediate a contaminated site. IAAC is of the view that although the Project may result in adverse environmental effects to fish and fish habitat, migratory birds including species at risk, and the physical health of PLFN and the Mi'kmaq of Nova Scotia, in the long term the Project will likely result in an overall improvement to these areas under federal jurisdiction. The main

potential adverse environmental effects of the Project in relation to section 5 of CEAA 2012 and the SARA are:

- effects on fish and fish habitat, including species at risk, due to mortality and injury, changes in fish health, sensory disturbance, and habitat alteration and loss;
- effects on migratory birds, including species at risk, due to disturbance, habitat alteration, fragmentation and loss, and mortality risk;
- effects on current use of lands and resources for traditional purposes due to loss of access, reduction in quality of resources, and change in the frequency and quality of experience;
- effects on the physical health, mental health and well-being, and socio-economic conditions of Indigenous peoples due to noise, changes to the quality of air, water, sediment, and country foods; and
- effects on physical or cultural heritage, and effects on archeological sites, cultural heritage resources and historic heritage sites, and paleontological sites

Mitigation measures would be implemented to prevent or reduce potential adverse effects of the Project. IAAC identified key mitigation measures, which include, but are not limited to: establish and implement a protocol for the euthanization and capture and relocation of fish; develop and implement a fish habitat offsetting plan; develop and implement measures to control erosion and sedimentation; conduct modelling of sediment transport and deposition due to the removal of the dam; carry out project activities in a manner that protects and avoids harming, killing, or disturbing migratory birds, nests, eggs, or habitat; conduct vegetation clearing, demolition of infrastructure, or any activities with the potential to impact water levels for waterbodies located within the site study area (SSA) outside of the migratory bird breeding and nesting period; develop measures to help prevent migratory birds from using waterbodies or Project infrastructure in which contact water may be stored or conveyed; retain the services of monitors to observe, record, and report on the implementation of the mitigation measures and follow-up programs required of the Proponent; conduct follow-up monitoring and if exceedances to established target levels are identified, update the Human Health Risk Assessment (HHRA) to assess post-remediation risks to the health of the Mi'kmaq of Nova Scotia; and develop a cultural resource management plan. Taking into account the implementation of these key mitigation measures, IAAC concludes that the Project is not likely to cause significant adverse environmental effects as defined in CEAA 2012.

If the Project proceeds, a follow-up program would be required to verify the accuracy of the EA predictions and to determine the effectiveness of the proposed mitigation measures. IAAC recommends that the follow-up program include measures such as: monitoring total suspended solids (TSS) concentrations and sediment deposition; monitoring benthic habitat; determining the effectiveness of mitigation measures related to avoiding harm to migratory birds, their eggs and nests; monitoring noise, sediment, soil, air, groundwater, surface water, and country foods as it related to the potential impact to the health of the Mi'kmaq of Nova Scotia. This report also presents IAAC's assessment of the potential impacts on the Aboriginal rights of the Mi'kmaq of Nova Scotia potentially affected by the Project. The mitigation measures and follow-up program requirements identified by IAAC will be recommended to the Minister of Environment and Climate Change Canada (the Minister) in establishing conditions as part of the EA decision statement under CEAA 2012. Conditions accepted by the Minister will become legally binding on the Proponent if the Minister ultimately issues a Decision Statement indicating that the Project may proceed.

The Minister will consider this report and comments received from Indigenous groups and the public when issuing the Decision Statement under CEAA 2012.

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List of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
Atlantic PIRI	Atlantic Partnership in Risk-Based Correction Action Implementation
CCME	Canadian Council of Ministers of Environment
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
COPC	Contaminant of potential concern
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EA	Environmental Assessment
Report	Environmental Assessment Report
EIS	Environmental Impact Statement
EIS Guidelines	Guidelines for the Preparation of an Environmental Impact Statement
EMP	Environmental management plan
ETR	External Technical Review
H_2S	Hydrogen sulphide
HHERA	Human Health and Ecological Risk Assessment
HHRA	Human Health Risk Assessment
IAA	*Impact Assessment Act*
IAAC	Impact Assessment Agency of Canada
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office

Abbreviation/Acronym	Definition
LSA	Local Study Area
Minister	Minister of Environment and Climate Change
Northern Pulp	Northern Pulp Nova Scotia Corporation
NO_x	Nitric oxide (NO) and nitrogen dioxide (NO2)
PAH	Polycyclic Aromatic Hydrocarbons
PLFN	Pictou Landing First Nation
PM	Particulate matter
PM_{10}	Particulate matter less than 10 microns in diameter
$PM_{2.5}$	Particulate matter less than 2.5 microns in diameter
Project	Boat Harbour Remediation Project
Proponent	Build Nova Scotia
RSA	Regional Study Area
SARA	*Species at Risk Act*
Section 35 rights	Section 35 of the Constitution Act, 1982
SSA	Site Study Area
SSTL	Site-specific target level
TSS	Total suspended solids
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compounds

Glossary

Term	Definition
A'se'k	A'se'k translates to "the other living space" in Mi'kmaq and was formerly a tidal estuary with traditional and historical significance to Pictou Landing First Nation. In 1967, A'se'k was reconstructed into a closed effluent stabilization lagoon, now commonly referred to as the Boat Harbour stabilization lagoon, or Boat Harbour.
Anadromous fish	Fish species that spend a portion of their lives in saltwater and return to freshwater to spawn.
Containment cell	An engineered structure designed to store hazardous or contaminated materials, isolating contaminants from the surrounding environment.
Critical habitat	Habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species (*Species at Risk Act* (section 2(1))).
Deleterious substance	Any substance that, if added to any water, would degrade or alter, or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or if by going through some process of degradation, it harms the water quality (*Fisheries Act* (paragraph 34(1)(a))). A substance is also deleterious if it exceeds a level prescribed by regulation.
Dewatering	The act of removing water from sediment by draining or filtration.
Dredging	The act of removing sediment or other material from the bottom of a water body.
Effluent	Treated or untreated wastewater that flows out of a treatment plant, sewer, or industrial outfall.
Environmental Impact Statement	A detailed technical document prepared by the proponent of a designated project to be assessed pursuant to CEAA 2012. The Environmental Impact Statement identifies the potential adverse environmental effects of a designated project including cumulative effects, measures to mitigate those effects, and an evaluation of whether the designated project is likely to cause any significant adverse environmental effects.
Environmental Impact Statement Guidelines	A document for the proponent that identifies the information requirements for the preparation of an Environmental Impact Statement for a designated project to be assessed pursuant to CEAA 2012. This document specifies the nature, scope and extent of the information required to be contained in the Environmental Impact Statement.

Term	Definition
Excavation	The act of removing soil or other materials through mechanical means.
Exposure pathways	Complete pathways through which contaminants move from their sources to receptors, leading to exposure events.
Exposure point concentration	An estimate of the average chemical concentration in an environmental medium in a defined area, which represents the concentration an individual would be exposed to from the medium in the defined area.
Ex-situ remediation	A remediation process involving the extraction of contaminated mediums from their original location for subsequent storage or treatment elsewhere.
Geotubes	Large, porous, tubular bags made of engineered geotextile that are used to dewater sludge by allowing water to filter through while retaining solid material.
Hot spot areas	Discrete locations within a contaminated site where concentrations of contaminants exceed regulatory standards or pose a risk to human health and the environment.
Landfill gas	A mixture of gasses resulting from the decomposition of organic material disposed of in a landfill, primarily methane and carbon dioxide.
Leachate	A liquid solution that forms as water percolates through waste materials.
Mi'kmaq of Nova Scotia	The Mi'kmaq First Nations of Nova Scotia, comprised of the following Indigenous groups: Annapolis Valley First Nation, Bear River First Nation, Eskasoni First Nation, Glooscap First Nation, Membertou First Nation, Millbrook First Nation, Paqtnkek First Nation, Pictou Landing First Nation, Potlotek First Nation, Sipekne'katik First Nation, Wagmatcook First Nation, Wasoqopa'q First Nation, and We'koqma'q First Nation.
Model domain	Spatial area or region modeled in a simulation, encompassing all relevant features, boundaries, and parameters considered in the analysis.
Natural attenuation	A process that relies on natural processes to decrease concentrations of contaminants in the environment over time.
Project Description	A document prepared by the proponent and submitted to IAAC to inform a decision on whether an environmental assessment of the designated project is required. The Project Description must include the information set out in the *Prescribed Information for the Description of a Designated Project Regulations* – including information about the possible adverse environmental effects of the Project.
Qualified individual	An individual who, through education, experience and knowledge relevant to a particular matter, provides the Proponent with advice within their area of

Term	Definition
	expertise. Knowledge relevant to a particular matter may include community and Indigenous knowledge.
Remedial objectives	Specific goals or target levels established to guide the remediation of a contaminated site.
Sediment	Any particulate matter that can be transported by fluid flow and which eventually is deposited as a layer of solid particles on the bottom of a body of water or other liquid.
Sites of significance	Any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance
Sludge	Solid, semi-solid, or slurry residual material that is produced as a by-product of the wastewater treatment processes.
Species at risk	Any species listed in Schedule 1 of the *Species at Risk Act* or addressed as "Endangered", "Threatened" or "Special Concern" by the Committee on the Status of Endangered Wildlife in Canada.
Surface-weighted Average Concentration	A process in which individual sample contaminant concentrations are weighted by their spatial area-of-influence or relative probability to be used by a receptor.
Tidal estuary	A semi-enclosed coastal water body where freshwater from rivers or streams becomes mixed with saltwater from the ocean.
Total suspended solids	Quantitative water quality measurement of the suspended solids, or sediment, in the water column and is the direct measurement of the total solids present in a waterbody.
Treatment media	Media used for physical, chemical, and biological treatment in a wastewater treatment component.

1 Introduction

Build Nova Scotia (the Proponent) is proposing the Boat Harbour Remediation Project (the Project) which would include the remediation of the Boat Harbour effluent treatment facility[1] and surrounding lands. The site study area (SSA) currently consists of several components: the Boat Harbour stabilization lagoon (Boat Harbour), settling basins, aeration stabilization basin, dam, effluent ditches, pipeline, an estuary, wetlands, and a hazardous waste containment facility (i.e., containment cell). The effluent treatment facility is located next to Pictou Landing First Nation (PLFN) and five kilometres east of the Town of Pictou, Nova Scotia.

The provincial government built the effluent treatment facility in 1967 to treat wastewater from industrial sources and in the process reconstructed Boat Harbour from a tidal estuary into a closed basin to collect solids from the wastewater. The effluent treatment facility stopped receiving effluent in January 2020 in accordance with the provincial *Boat Harbour Act*. The Project would remove hazardous waste-bearing sludge (a mixture of water, sediments, and organic and inorganic chemicals that have collected on the bottom of the effluent treatment facility over time) from the effluent treatment facility. The existing hazardous waste containment cell located in the SSA would be vertically expanded to increase its capacity from 220,000 cubic metres to up to 1,074,000 cubic metres (approximately 490%) for the storage of hazardous waste-bearing sediment that would be removed during the remediation activities. Tidal influence would be restored to Boat Harbour.

The Impact Assessment Agency of Canada (IAAC) determined that the Project is a designated project, pursuant to item 30 of the Physical Activities Regulations under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012):

> ***The expansion of an existing facility used exclusively for the treatment, incineration, disposal or recycling of hazardous waste that would result in an increase in hazardous waste input capacity of 50% or more.***

On February 22, 2019, IAAC determined that a federal environmental assessment (EA) is required for the Project.

On August 28, 2019, the Impact Assessment Act (the IAA) came into force and CEAA 2012 was repealed. However, in accordance with the transitional provisions of the IAA, this EA remains under CEAA 2012 as if it had not been repealed.

[1] The effluent treatment facility, as defined by the *Boat Harbour Act*, consists of two settling basins, aeration stabilization basin, the Boat Harbour stabilization lagoon, and a three-kilometre pipeline.

IAAC issued Environmental Impact Statement (EIS) Guidelines to the Proponent that describe the information required to support the EA process, including the environmental effects and the factors that must be considered.

The EIS Guidelines focus the assessment by identifying components that have particular environmental value or significance and may be affected by the Project. The assessment focused on features of the natural and human environment that may be adversely affected by the Project and that are within federal jurisdiction as described in subsection 5(1) of CEAA 2012, referred to as valued components. The assessment also focused on changes to valued components that may be caused by the Project and are directly linked or necessarily incidental to federal authorizations as described in subsection 5(2) of CEAA 2012. The provincial Minister of Environment informed the Proponent on April 10, 2019, that a provincial EA is not required for the Project, as environmental impacts will be addressed through the federal process which includes input from provincial experts, as well as through any required provincial authorizations and approvals.

IAAC considered the following valued components in the assessment, as outlined in Appendix B of this report:

- fish and fish habitat, including marine plants and species at risk, wetlands, and commercial fisheries;
- migratory birds, including species at risk and wetlands;
- Indigenous Peoples – current use of lands and resources for traditional purposes, including navigation;
- Indigenous Peoples – physical and cultural heritage; and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;
- Indigenous Peoples – health and socio-economic conditions; and
- federal lands.

This report provides a summary of the analysis conducted by IAAC in reaching its conclusion, in accordance with CEAA 2012, on whether the Project is likely to cause significant adverse environmental effects after taking into account the proposed mitigation measures. The Minister of Environment and Climate Change Canada (the Minister) will consider the final version of this report when issuing the Environmental Assessment Decision Statement to the Proponent of the Project under CEAA 2012.

IAAC's analysis is informed by various sources, including:

- the EIS; and
- additional information received from the Proponent in response to the information requirements issued by IAAC following its review of the EIS:
    - the External Technical Review (ETR) of the alternatives assessment and containment cell design that was conducted by external third-party reviewers;
    - advice from expert federal and provincial departments and agencies;
    - comments received from PLFN; and
    - comments received from the public.

IAAC determined the significance of residual effects of project activities by taking into account the mitigation measures that it considered necessary. IAAC also considered the effects of accidents and malfunctions that may occur in connection with the Project (Section 6.1), the effects of the environment on the Project (Section 6.2), and cumulative environmental effects, which are the combined impacts of project activities and other past, present, and future physical activities (Section 6.3).

IAAC invited PLFN, other Mi'kmaq of Nova Scotia communities, and the public to provide comments on the content, conclusions, and recommendations set out in the draft report and on the draft potential conditions. After taking into consideration comments received, IAAC finalized and submitted the report to the Minister to support a decision on whether the Project is likely to cause significant adverse environmental effects. If the Minister determines that the Project is not likely to cause significant adverse environmental effects, a Decision Statement containing legally binding conditions will be issued.

1.1 Historical Context

1.1.1 Boat Harbour Effluent Treatment Facility

PLFN is a Mi'kmaq community adjacent to the Project with approximately 690 members, with approximately 500 members on reserve[2]. The community includes a band office, health centre, school and playground, fisheries compound, cemetery, a Royal Canadian Mounted Police detachment, fire station, church, gas station, convenience store, and café.

In 1967, the provincial government constructed the Boat Harbour Effluent Treatment Facility (Figure 1) to treat pulp mill effluent. A tidal estuary connected to the Northumberland Strait was closed off from the marine environment and reconstructed into a closed effluent stabilization lagoon (referred to as "Boat Harbour stabilization lagoon" or "Boat Harbour"). The effluent treatment facility was first used by Scott Maritimes for the treatment of effluent from its pulp mill, located at Abercrombie Point, west of the East River. Canso Chemicals Ltd., a chlor-alkali plant that produced chlorine, caustic soda, and hydrogen for use at the pulp mill was situated on the property adjacent to the pulp mill. Effluent from Canso Chemicals Ltd. was also treated by the effluent treatment facility from 1971 to 1992.

The effluent treatment facility has undergone various changes since its construction in 1967. Between 1967 and 1972, prior to the construction of the settling basins and aeration stabilization basin, raw effluent was discharged from the pipeline to an effluent ditch located east of Highway 348, which flowed into a natural wetland area (used as settling ponds) prior to being discharged into Boat Harbour. In 1996, a containment cell was constructed and was used for the storage of dewatered sludge from the aeration stabilization basin, starting in 1996.

[2] Crown-Indigenous Relations and Northern Affairs Canada. 2024. First Nation Profiles – Pictou Landing.

In 2008, Northern Pulp Nova Scotia Corporation (Northern Pulp) took ownership of the pulp mill and continued leasing the effluent treatment facility from the Province of Nova Scotia for the treatment of pulp mill effluent.

In 2014, it was discovered that the pipeline from the pulp mill was leaking untreated effluent into a wetland, which sparked protests by the community. These protests led to the *Boat Harbour Act* being passed in 2015, which prohibits effluent from being discharged into the effluent treatment facility after January 31, 2020. In accordance with this Act, the effluent treatment facility ceased the receipt of effluent in January 2020. The pulp mill stopped operations at that time and was placed into long-term hibernation for an indefinite period of time.

The Proponent's stated the purpose of the Project is to remediate the effluent treatment facility and associated lands, with the goal of returning Boat Harbour to a tidal estuary.

1.1.2 A'se'k

In Mi'kmaw, Boat Harbour is known as A'se'k, which translates to "the other living space," because of its significance in the daily life of Mi'kmaq. Prior to the construction of the effluent treatment facility, A'se'k was a tidal estuary traditionally used by PLFN for refuge, recreation, fishing, hunting, and gathering, as well as for physical, mental, spiritual, and emotional purposes. A'se'k was long established as a cultural centre for the Mi'kmaq of Nova Scotia and was described as an important area for the transfer of knowledge to younger generations. As described in the PLFN Well-being Baseline Study, when PLFN refers to "A'se'k" they are referring to what once was; in contrast, "Boat Harbour" refers to what A'se'k has become.

The Mi'kmaq of Nova Scotia ceased harvesting fish, shellfish, birds, wildlife, and plants for sustenance, and ceremonial and recreation activities within and surrounding the area when the effluent treatment facility was constructed and became operational in 1967. As early as 1965, PLFN expressed their opposition to the effluent treatment facility and concerns about the loss of aquatic and terrestrial species within and in close proximity to Boat Harbour, as well as safe anchorage for boats, and the ability to swim or take part in other recreational activities along the Boat Harbour shoreline.

PLFN describes the historical importance of A'se'k as a source of food, recreation, medicines, and cultural practice:

> ***There was a time when most of our food was from there. Every family was hunting, fishing, trapping, and gathering. We ate healthier then. The salmon ran in the streams, and so many smelts we would take home buckets and buckets of them. We would go down with our shovels and buckets and dig up clams, cooking them right there on the shore.[3]***

[3] Castleden, H., et al. 2017. "Put It Near the Indians": Indigenous Perspectives on Pulp Mill Contaminants in Their Traditional Territories, as cited in the Pictou Landing First Nation Well-being Baseline Study

The meat was divided accordingly, nobody was left behind. The men would be up all night carving the meat, and people would come by to pick up their share… The people… were looking after the community.[4]

We would swim and skate, sometimes make a great big bonfire and we'd skate around. Oh my god, it was beautiful —sometimes it's just the moonlight.[5]

We did lots of berry picking there, and gathered other plants and medicines too. Women would collect mayflowers and blueberries—sell them in town for a little extra pin money. Older folks knew about the Indian medicines that came from the woods. Going to A'se'k was like a family outing for us. Sometimes there would be a bunch of families gathered, cooking and eating together right there on the shore.

PLFN stated they have a strong desire to return Boat Harbour to the way it was, before the effluent treatment facility was constructed and to be able to use the lands and resources in the future, after remediation is completed. PLFN has expressed their desire for Boat Harbour to be remediated and naturally restored so their relationship to the water and land of A'se'k can be re-established.

[4] Castleden, H., et al. 2017. "Put It Near the Indians": Indigenous Perspectives on Pulp Mill Contaminants in Their Traditional Territories (Pictou Landing First Nation, Canada), as cited in the Final Position of Pictou Landing First Nation on Proposed Boat Harbour Remediation Project.

[5] Membertou Geomatics Solutions. 2018. Boat Harbour Remediation Mi'kmaq of Nova Scotia Ecological Knowledge Study.

2 Project Overview

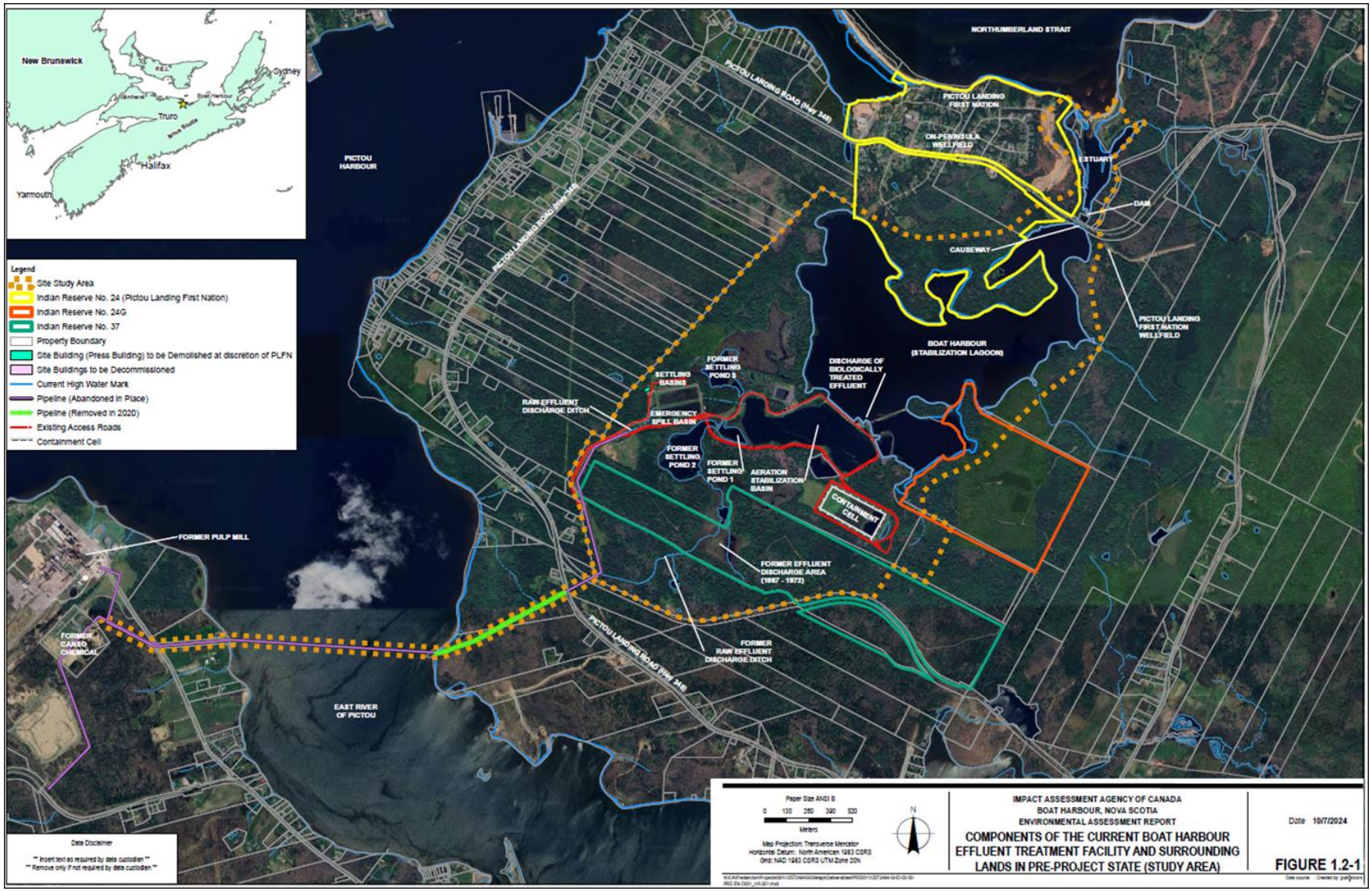
The Project is located in north-central Nova Scotia on the Northumberland Strait, five kilometres east of the Town of Pictou in the immediate proximity of PLFN (Figure 1). The SSA is approximately 546 hectares and encompasses the effluent treatment facility which was used for the treatment of pulp mill effluent from 1967 to 2020. The SSA includes the Boat Harbour stabilization lagoon (Boat Harbour, also known to PLFN as A'se'k), settling basins, aeration stabilization basin, dam, causeway along Highway 348[6], effluent ditches, a pipeline, a hazardous waste containment cell, estuary, wetlands, and upland areas surrounding the effluent treatment facility. The SSA also contains a treatment pad that was used during the pilot scale testing program that was completed in July 2019 to determine, validate, and verify the technologies proposed for the remediation of the effluent treatment facility. Effluent from Boat Harbour discharged over the dam into the estuary prior to being released into the Northumberland Strait. Access to portions of the SSA is currently restricted with gates, perimeter fencing, and signage.

The Project would involve removing hazardous sludge, sediments, and soils from the effluent treatment facility and surrounding lands and waters and storing the resulting hazardous waste in the existing containment cell. The containment cell has a footprint of roughly 6.7 hectares and contains approximately 180,000 cubic metres of waste which resulted from historic maintenance activities required for the effluent treatment facility. To accommodate additional waste resulting from remediation activities, the existing containment cell's liner and leachate management system would be upgraded, and the containment cell would be expanded vertically by up to 24 metres, maintaining the same 6.7-hectare footprint. After remediation is complete, the dam and causeway located between Boat Harbour and the estuary would be removed, returning Boat Harbour to a tidal estuary.

The land immediately surrounding Boat Harbour, aside from the parcel of land owned by the Province of Nova Scotia containing the operational components of the effluent treatment facility and containment cell, is primarily federally-owned (Indian Reserves 24, 24G, and 37), or owned by the Pictou Landing Development Corporation, a wholly-owned subsidiary of PLFN. Nova Scotia Public Works (formerly the Nova Scotia Department of Transportation and Infrastructure Renewal) currently owns the 128-hectare parcel of land containing the effluent treatment facility operational components. Additionally, to obtain access to the effluent treatment facility to complete remediation activities, the Proponent has secured departmental ownership of additional parcels of provincially-owned land located around the estuary. After the completion of the Project, the land containing the containment cell would remain under the ownership of the Province after Project completion. Approximately 173 hectares would be transferred to PLFN.

[6] Highway 348 is also referred to as to Pictou Landing Road in the EIS.

Figure 1: Components of the Current Boat Harbour Effluent Treatment Facility and Surrounding Lands in Pre-Project State



Source: Adapted from Boat Harbour Remediation Project, Environmental Impact Statement, Figure 1.2-1.

Figure Description: A pipeline runs from west to east, originating at the pulp mill property west of the East River, crossing under the East River to the effluent treatment facility. Infrastructure associated with the effluent treatment facility are shown. Indian Reserve land is located directly adjacent to the Boat Harbour stabilization lagoon, to the north and east, and south of the existing containment cell. The Northumberland Strait is located north of the effluent treatment facility.

2.1 Temporal Boundaries

Temporal boundaries define the duration over which project components interact with each valued component. The Proponent defined the temporal boundary of the assessment as encompassing the phases (i.e., site preparation and construction, operation, decommissioning and abandonment, and closure and post-closure) of all project component and activities. The temporal boundary for the specific components of the Project required for the remediation of the SSA would last approximately seven years. Post-closure activities (e.g., long-term site monitoring and the ongoing operation of the containment cell) would carry on for 25+ years after the start of the Project.[7]

2.2 Spatial Boundaries

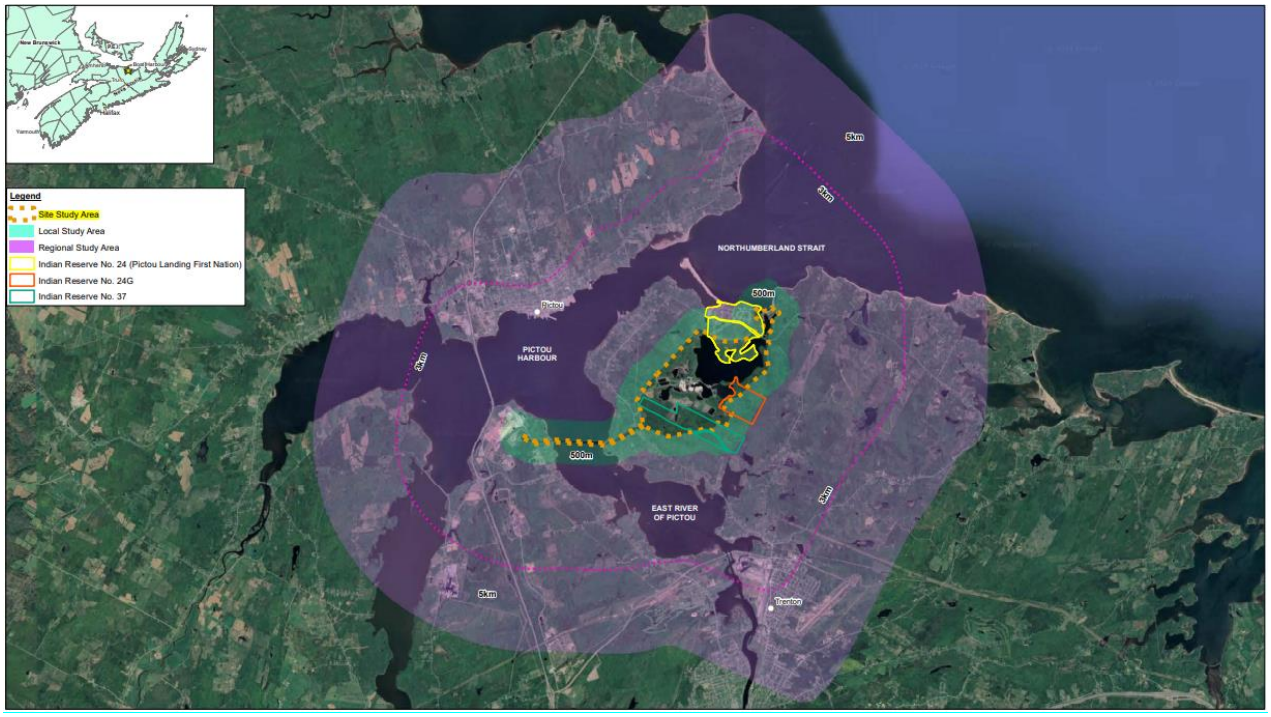
Spatial boundaries of an EA define the area within which a project may interact with the environment and cause effects. The Proponent defined three types of spatial boundaries, shown in Figure 2. The spatial boundaries vary among valued components depending on the nature of the Project's interaction with the environment. Generally, the Proponent identified the following study areas, which apply to most of the valued components assessed:

- Site study area (SSA): The SSA is the anticipated area of direct physical disturbance associated with all phases of the Project. The SSA is the same for each valued component and is generally defined by the Proponent as the area spanning from the effluent pipeline from the first standpipe on the pulp mill property, below the East River, through existing and historical Boat Harbour lands, Boat Harbour and its banks, extending to Northumberland Strait.
- Local study area (LSA): The LSA includes the SSA and the geographic extent of effects on the given valued component, and is generally defined as all lands and water within 500 metres of the SSA.
- Regional study area (RSA): The RSA is valued component-specific and encompasses both the SSA and the local assessment area. The RSA is generally defined as all lands and water within two to five kilometres of the SSA.

Appendix C provides a description of each valued components' spatial boundaries, as defined by the Proponent.

[7] The post-closure phase ends when the containment cell leachate meets provincial guidelines for direct release to the environment, or the leachate no longer has the potential to have an adverse effect on the environment as determined by Nova Scotia Environment and Climate Change.

Figure 2: Proponent's Spatial Boundaries for Valued Components



Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.1-1.

Figure Description: The SSA encompasses the effluent treatment facility, as well as the area containing the pipeline spanning from the pulp mill to the effluent treatment facility. The LSA for most valued components encompasses the SSA and all lands and waters 500 metres from the SSA. The RSA for most valued components encompasses the SSA, LSA, and all lands and waters two to five kilometres from the SSA, depending on the valued component.

2.3 Project Components and Activities

2.3.1 Waste Management and Containment Cell

The waste management component of the Project involves project activities associated with the management of solid and liquid wastes generated by the Project. Waste would be generated from the following project activities:

- removal and dewatering of sludge from the former effluent ditches, settling basins, wetlands, aeration stabilization basin, Boat Harbour stabilization lagoon, and estuary;
- removal of dewatered sludge from the pilot scale testing treatment pad;
- cleaning[8] and decommissioning the pipeline that runs from the pulp mill to the effluent treatment facility;
- remediation activities resulting in industrial waste, such as spent treatment media;
- decommissioning of infrastructure, including the causeway at Highway 348 and the dam; and
- the generation of leachate during the long-term storage of waste in the containment cell.

The existing containment cell has a footprint of approximately 6.7 hectares and contains approximately 188,000 cubic metres of unconsolidated sludge that resulted from the regular maintenance of the effluent treatment facility. The maximum capacity of the existing containment cell is approximately 220,000 cubic metres, and would have to be expanded to accommodate the dewatering and storage of hazardous waste resulting from remediation activities.

Site preparation activities required for the waste management component are estimated to occur during the first two years of the Project. The existing containment cell would be expanded vertically to accommodate the storage of approximately 930,000 cubic metres of waste resulting from the Project. The Proponent stated that if required, the containment cell could be expanded to a capacity of up to 1,073,000 cubic metres. Prior to these modifications, the waste currently stored in the containment cell would be temporarily relocated to one of the settling basins, or to the aeration stabilization basin. The existing leachate collection system and bottom liner systems of the containment cell would then be upgraded to improve the safety performance of the cell (Figure 3). A lined stormwater management pond outlet structure, perimeter berms, and a leachate holding tank would also be constructed. These upgrades would require two to four pieces of heavy equipment at any given time, such as excavators, rock trucks, bobcats, loaders, dozers, a compactor, slurry pumps, and temporary generators. Materials required for these upgrades would be hauled from off-site using a 15-yard capacity dump truck. All site preparation activities would occur during daytime hours.

To reduce the volume of waste to be stored in the containment cell, construction and demolition waste would be disposed of at a third-party disposal site, and non-contaminated organic material (e.g., cattails)

[8] The cleaning of the pipeline by Northern Pulp has already occurred. When the effluent treatment facility stopped receiving effluent in 2020, the pipeline was flushed with clean water and then inspected to ensure it was void of effluent.

would be mechanically processed and used as mulch or soil. The final volume of waste to be stored in the containment cell will be unknown until the remediation is complete.

During remediation activities in the SSA, dredged sludge would be pumped through a dredge line to the containment cell to be dewatered by Geotubes.[9] Water draining from the Geotubes (dewatering effluent, or leachate) would be collected by the containment cell's leachate collection system and piped back to areas of the effluent treatment facility being dredged, or to a downstream area not yet remediated. The leachate would be held in Boat Harbour to undergo natural attenuation and the pre-treated water would not be released into the natural environment until site-specific discharge criteria are met.

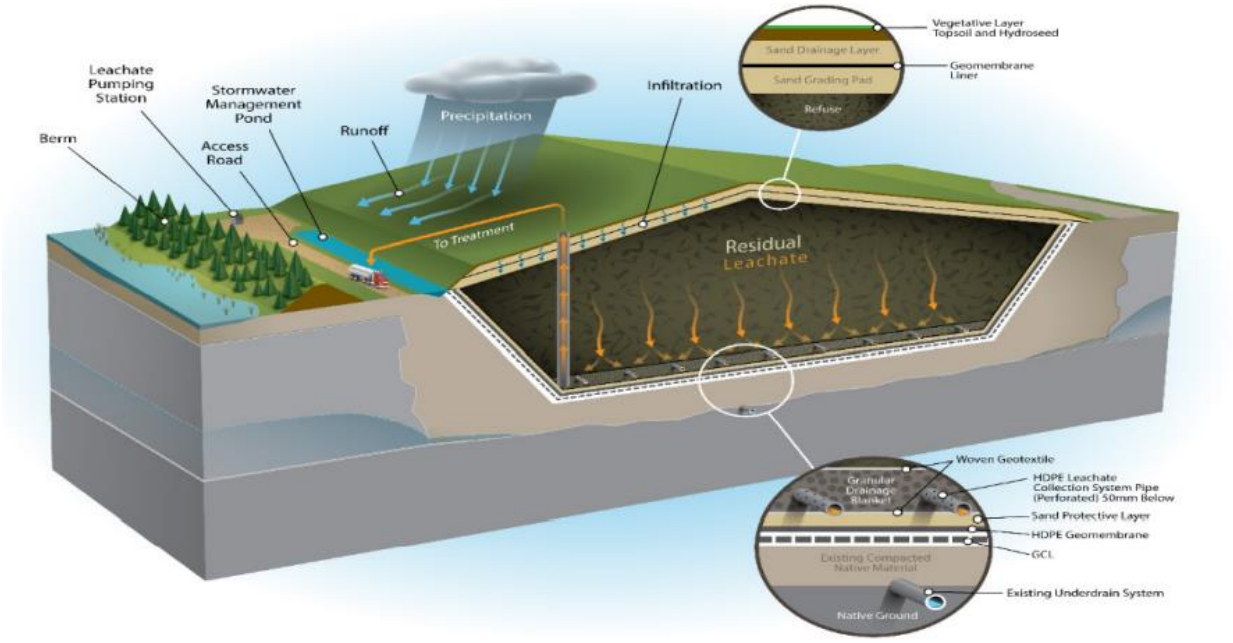
Following the completion of remediation activities in the SSA (approximately year 5 of the Project), an interim cover would be placed on the containment cell to minimize the amount of leachate generation due to precipitation, thereby reducing the quantity requiring management. The interim cover would remain in place for a minimum of one to two years after remediation to allow for further dewatering and consolidation of the waste. During this interim period, leachate would be directed to a temporary leachate treatment facility. Treated leachate meeting the same site-specific risk-based discharge criteria (as discussed above) would be discharged to Boat Harbour and ultimately released into the Northumberland Strait. Leachate not meeting applicable criteria would be recirculated in the temporary leachate treatment facility until the criteria are met. Prior to the placement of the final containment cell cover, any residual solids resulting from the temporary leachate treatment facility would be disposed of in the containment cell, if practicable. The temporary leachate treatment facility would be used for approximately one to two years after remediation activities are complete, and for a short period of time after containment cell closure.

Containment cell closure would begin after remediation and is expected to occur between years 6 and 7 of the Project. A final cover would be installed on the containment cell, which would also be integrated with water ditching and a stormwater management system used to control clean surface water runoff. Containment cell infrastructure to support long-term monitoring, including groundwater and leachate monitoring wells, containment cell gas monitoring probes, surface water monitoring stations, perimeter fencing, signage, and an access road (Figure 3 and Figure 4) would also be constructed.

After the closure of the vertically-expanded containment cell (i.e., post-closure phase), it would store waste for an indeterminate amount of time and be subject to long-term monitoring and care. Leachate would be collected and conveyed to a buried leachate holding tank. The contents of the holding tank would be regularly disposed of at an approved off-site wastewater treatment plant. The post-closure phase would continue until the waste within the vertically-expanded containment cell no longer has the potential to have an adverse effect on the environment, which would be determined by Nova Scotia Environment and Climate Change and post-closure monitoring results.

[9] Geotubes are porous bags made of engineered geotextile that are used to dewater sludge by allowing water to filter through while retaining solid material.

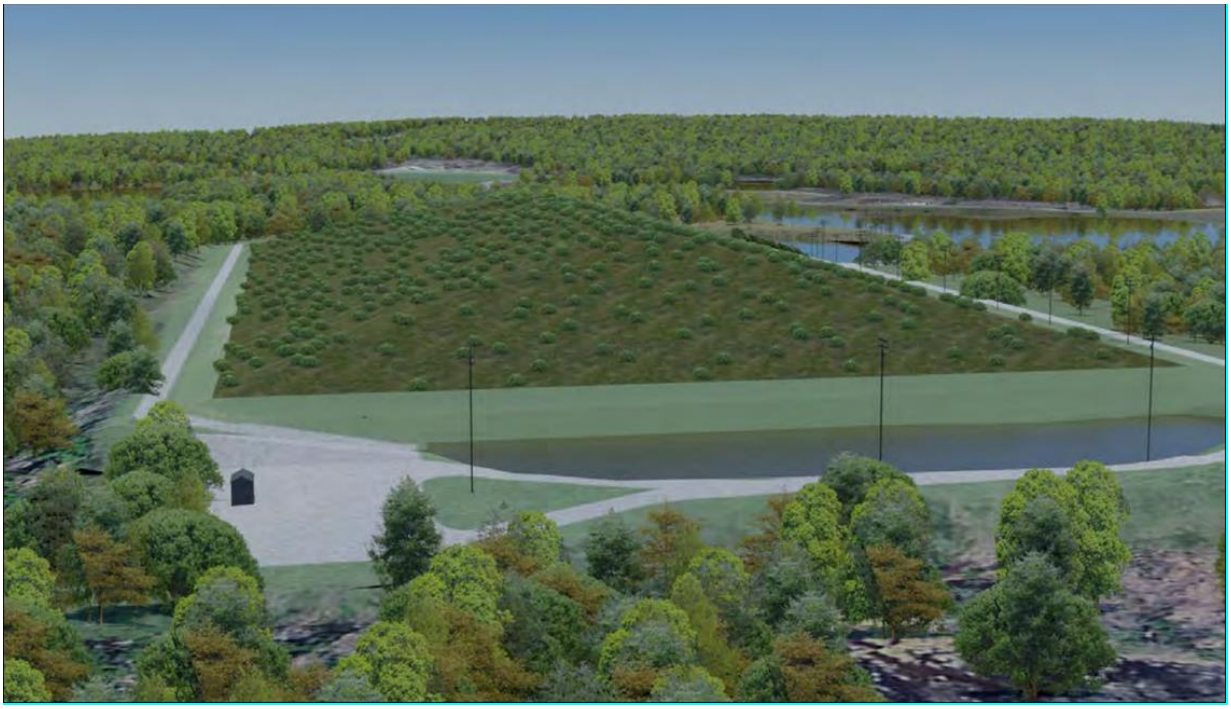
Figure 3: Schematic of the Proposed Final Containment cell



Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 3.2-1.

Figure Description: Cross section of the expanded containment cell showing the leachate collection system, stormwater management pond, and final cover.

Figure 4: Digital Rendering of the Proposed Final Containment Cell.



Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 3.1-4.

Figure Description: Digital rendering of the final containment cell, leachate pumping facility, stormwater management pond, and access road.

2.3.2 Remediation

Site preparation activities related to the wetland management and dredging components are predicted to take place during the second year of the Project, and include:

- clearing vegetation for the construction of access points throughout the SSA to allow equipment to access areas requiring remediation;
- existing access road upgrades and realignment;
- potential construction of temporary access roads, and
- installation of silt curtains, and water level control structure at the causeway to facilitate remediation activities;

Site preparation activities related to access roads would require the use of four to six pieces of heavy grading equipment at a time, such as excavators, as well as the use of a 15-yard capacity dump truck for daily hauling of material off-site. The clearing of access points would require two to four pieces of heavy equipment at any given time, such as excavators, rock trucks, bobcats, loaders, dozers, a compactor, and pile drivers.

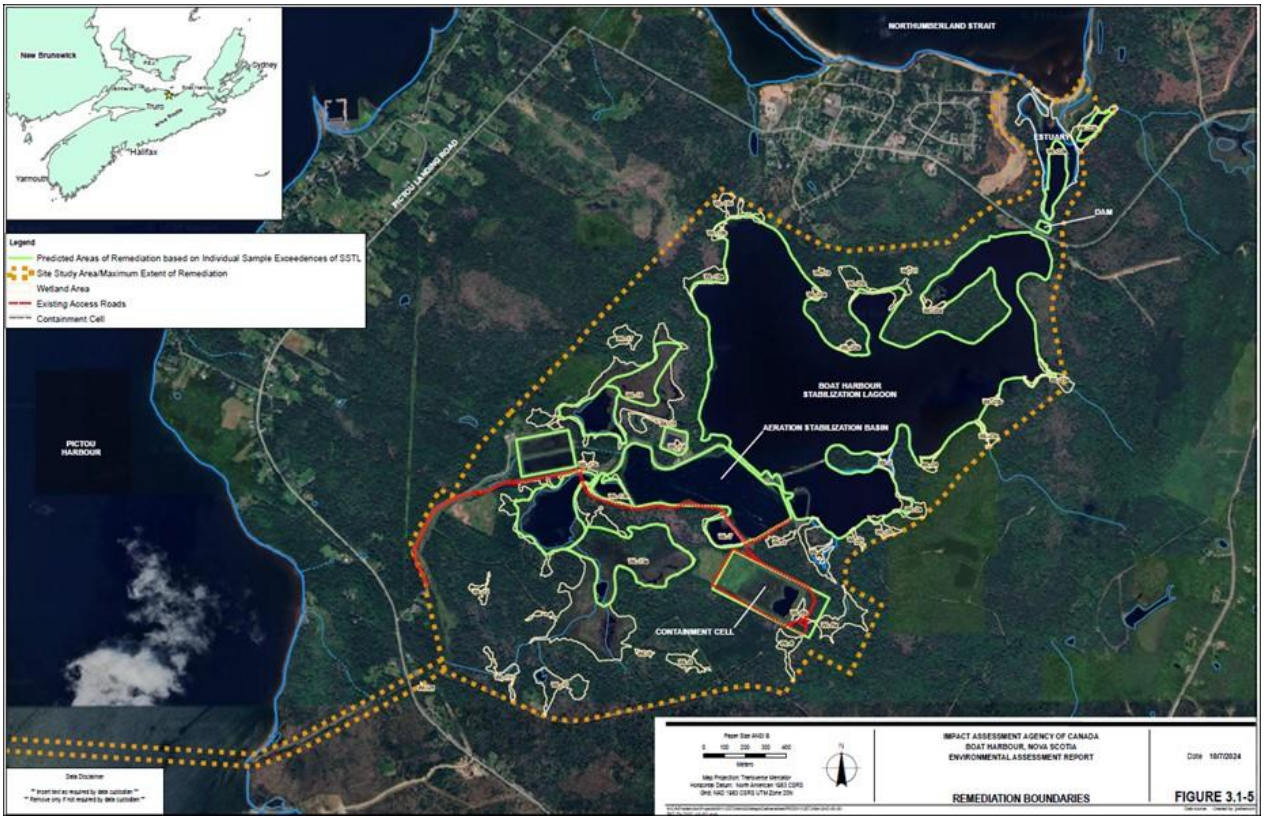
Following these site preparation activities, remediation activities in the SSA would commence. Remediation of the SSA would be expected to start from the upstream portion of the effluent treatment facility (i.e., the freshwater wetlands) and move downstream to ensure any impacts related to the activities would be captured in the downstream treatment facilities (e.g., settling basins).

The freshwater wetlands would be remediated in year two of the Project, using a combination of two remediation approaches: ex-situ remediation and natural attenuation. The most highly contaminated areas of the freshwater wetlands would undergo ex-situ remediation, which is the removal of contaminated sediment, sludge, and soil to be stored in the containment cell. The remaining wetland areas would be left to naturally attenuate, which means leaving the contamination in place to allow contaminant concentrations to decrease naturally.

Following the remediation of the freshwater wetlands, the remediation of the remainder of the SSA would commence. The entire footprint of Boat Harbour and associated basins below the high-water mark would undergo ex-situ remediation, which would be expected to occur during years two to five of the Project. After the remediation of these areas, the estuary would be remediated similarly to the freshwater wetlands, in which the most highly contaminated areas would undergo ex-situ remediation and the remaining areas would be left in place to naturally attenuate.

As part of the Human Health Ecological Risk Assessment, further described in Section 5.3 (Health Conditions) of this report, the Proponent proposed site-specific target levels (SSTLs) to be used as the remedial objectives for the Project, which represent the maximum concentration of specific contaminants at a site that are considered protective of human health. Using these proposed SSTLs and with consideration of exposure risks in the SSA, the Proponent estimated that approximately 27 hectares of the freshwater wetlands and 1.7 hectares of the estuary would require ex-situ remediation. However, the extent of ex-situ remediation required in the freshwater wetlands and estuary would depend on the remedial objectives used, which would be finalized during the provincial industrial approval process. Figure 5 shows the predicted areas in the SSA requiring ex-situ remediation.

Figure 5: Predicted Remediation Boundaries



Source: Adapted from Boat Harbour Remediation Project, Environmental Impact Statement, Figures 3.1-5 and 3.1-6.

Figure Description: Areas within the SSA predicted to require ex-situ remediation.

Sludge removal in tight or shallow areas that cannot be hydraulically dredged may require mechanical excavation. Mechanically excavated waste would be loaded onto a barge and mixed with water prior to being pumped into the containment cell or transferred by haul trucks to the containment cell for disposal.

Prior to moving to a new dredging area, sampling of the dredging boundaries and near-shore areas would be completed to ensure the remaining sediment meets the applicable remedial objectives. If this sampling shows that the area undergoing ex-situ remediation does not meet remedial objectives, additional dredging and subsequent confirmatory sampling would be repeated until the remedial objectives are met. The exact extent of the freshwater wetlands and estuary requiring ex-situ remediation is not known at this time, but regular sampling during remediation of these areas would be used to further delineate the areas requiring ex-situ remediation. After the ex-situ remediation of the wetlands, the portions of wetlands permanently removed in the construction areas, as well as other disturbed shoreline areas would be infilled and regraded. To help ensure the restoration of the wetlands, seeding or planting of native vegetation would be completed in these areas.

The Proponent anticipates that remediation would require the operation of dredges, excavators, rock trucks, dozers, loaders, and a mid-size compactor. Wetland management activities, such as dredging of the wetlands and estuary, would occur daily between 7:00am and 11:00pm during the summer months, from June to September when low flows are expected. Dredging in Boat Harbour and associated basins is anticipated to occur daily, up to 24 hours per day from March to November.

2.3.3 Infrastructure Decommissioning

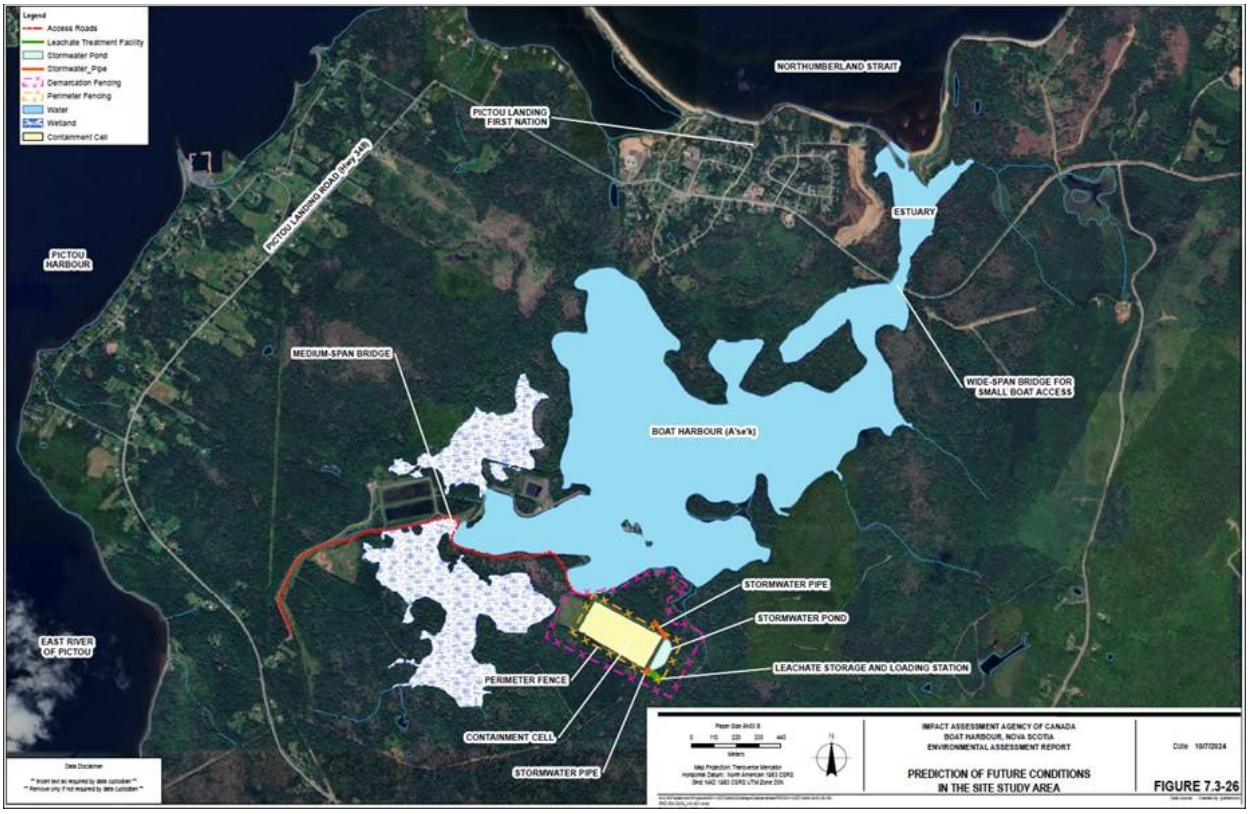
Causeway at Highway 348

Project activities associated with the decommissioning of the existing causeway and the construction of the new bridge are anticipated to occur during year 6 of the Project. To prepare for the decommissioning of the existing causeway, a temporary water main would be constructed adjacent to the new bridge location to ensure PLFN does not lose access to their water supply during these activities. A single-lane temporary by-pass causeway would be constructed north of the existing causeway to reduce impacts to the flow of traffic. The existing causeway and all associated culverts would then be removed to accommodate the new bridge. The bridge would then be constructed, which would include a new support system for the water main. When the new bridge is fully operational, the temporary by-pass causeway would be removed. The Proponent anticipates the new bridge to be in operation for approximately 75 years or more.

Dam

The dam is predicted to be decommissioned in years 6 and 7 of the Project, after all remediation activities are complete. Prior to the decommissioning of the dam, a temporary structure such as a cofferdam would be installed between the dam and the mouth of the estuary to prevent tidal influence from impacting the decommissioning activities. The dam would be mechanically demolished, and the channel from Boat Harbour to the estuary would be dredged to match the channel shape and depth required for the construction of the new bridge. The demolition of the dam would result in the connection of the freshwater waterbodies within the SSA to be opened up to the marine environment (i.e., the Northumberland Strait), which would restore tidal influence to Boat Harbour. Figure 6 illustrates what the SSA may look like post-closure, after tidal influence returns to Boat Harbour.

Figure 6: Prediction of Future Conditions in the Site Study Area[10]



Source: Adapted from Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.3-26

Figure Description: Predicted post-closure conditions within the SSA.

Infrastructure decommissioning activities generally would require a crew of four to eight staff, with equipment such as a bobcat, dump truck, and boom-lift. All infrastructure decommissioning activities, including for the components described below, would occur between 7:00 am and 11:00 pm.

Treatment Buildings and Pipeline

The SSA currently contains multiple small buildings and structures located throughout which were used for the operation of the effluent treatment facility, which would be decommissioned as part of the Project. In years 6 and 7 of the Project, any hazardous materials associated with the treatment buildings (e.g., asbestos, lead paint, and any other hazardous building materials or products) would be abated (i.e., removed) and the buildings would be de-energized. In year 7, the buildings would be demolished, and demolition waste would be stockpiled and disposed of off-site. The SSA includes sections of pipeline for

[10] The settling basins shown on this figure would not be present during post-closure. Settling basins would be remediated and infilled as part of the Project.

which decommissioning and abandonment in place will be finalized.[11] This will involve plugging manholes and capping pipeline ends.

[11] A section of the pipeline spanning from Highway 348 to the shoreline of Indian Cross Point was removed by Northern Pulp. After removal, cut pipeline ends were capped and the areas were backfilled with clean soil.

3 Alternatives Assessment

The Proponent was required to identify and assess alternative means of carrying out the Project that are technically and economically feasible, including their potential environmental effects. The Proponent assessed several alternatives to the project components and activities (Section 3.1).

PLFN raised concerns around the Proponent's assessment of waste disposal alternatives. In response to those concerns, IAAC conducted an ETR to obtain independent advice on the Proponent's assessment of waste disposal alternatives (Section 3.2). Additionally, based on PLFN's comments, the Proponent was required to assess a parcel of land owned by PLFN as a potential containment cell location (Section 3.3).

3.1. Proponent's Alternatives Assessment and Views Expressed

3.1.1 Dredging Alternatives

The Proponent considered two dredging approaches: removal of sludge under wet and dry conditions using either Geotube dewatering or clay stabilization.

The Proponent determined during pilot scale testing that removal of sludge via dry dredging was not possible in the Boat Harbour stabilization lagoon due to the soft underlying marine sediment and therefore identified wet dredging as the preferred dredging method. Dewatering using Geotubes was chosen over clay stabilization because clay stabilization would increase the volume of sludge to be managed and require substantial off-site clay product.

3.1.2 Wetland Management Alternatives

The Proponent assessed two approaches to remediation of the wetlands and estuary: natural attenuation and ex-situ remediation of contaminated sludge.

The Proponent determined that natural attenuation was the preferred approach from a technical, economical, and environmental point of view, however based on the results of a human health and ecological risk assessment (HHERA) which indicated that based on an EPC risk management approach, approximately 36 percent (27 hectares) of the freshwater wetlands and 17 percent (less than two hectares) of the estuary would require ex-situ remediation and disposal in the containment cell to reduce the potential for risk to human health. The remaining areas in the wetlands and estuary would be left in-place for natural attenuation.

3.1.3 Waste Management Alternatives

The Proponent considered alternatives for the disposal of hazardous and non-hazardous waste generated during the remediation of the effluent treatment facility: off-site disposal, construction of a new containment cell on-site, and a combined approach to use both the existing containment cell and constructing a new on-

site containment cell. Treatment through incineration was also considered but was ruled out due to potential impacts to air quality, perceived public opposition, and regulatory issues. Thermal destruction and separation was also considered, however the technology is not proven, therefore it was not carried forward in the assessment. The Proponent determined that the options involving the construction of a new containment cell on-site would likely be considered unacceptable by nearby residents due to the visual appearance, and the small setback distances from adjacent properties. Therefore, the Proponent evaluated the remaining two waste management options: the expansion and modification of the existing containment cell to store waste and off-site disposal to an existing off-site facility located within 175 kilometres of the SSA.

The off-site disposal option was determined by the Proponent to be less technically, environmentally, and socially feasible than the storage of waste in the existing containment cell. This is primarily due to the number of truck trips that would be required to dispose the waste off-site. This increase of traffic could disturb local residents or cause environmental effects due to the increase in traffic, noise, and dust. Additionally, the Proponent stated that there are currently no off-site landfills within Nova Scotia that would be able to accept waste from the effluent treatment facility due to its high concentration of dioxins and furans, and obtaining approval at an existing landfill could take up to five years. Economically, the Proponent stated that both options are feasible, as the transportation of waste for the off-site disposal option would be more expensive than the expansion and use of the existing containment cell, but there would also be costs associated with managing the long-term storage of waste in the existing containment cell.

The Proponent identified the use of the existing containment cell as the preferred approach as it was the most technically, environmentally, and socially feasible.

In response to PLFN's concerns about storing waste in the existing containment cell, an ETR was conducted on the Proponent's analysis of waste management alternatives (Section 3.2).

3.1.4 Water Management Alternatives

The Proponent considered two options for managing the leachate draining from the containment cell: on-site management and off-site disposal. The Proponent identified a combined approach as the preferred option, depending on the project phase.

The Proponent did not assess alternative means of managing water during remediation, as mixing with the un-remediated surface water within the effluent treatment facility was identified as the only feasible method of managing the impacted surface water.

The Proponent determined that after the placement of the final containment cell cover, off-site disposal of leachate was preferred over on-site treatment due to factors such as: lower risks to the health and safety of workers, ease of obtaining approvals, the accessibility of required materials, equipment, and contractors for implementation, and the lower risk of adverse environmental effects.

3.1.5 Infrastructure Decommissioning Alternatives

The Proponent considered the following options for decommissioning the effluent pipeline: clean, inspect, and abandon in place; fill and abandon in place; and complete removal. The Proponent determined that

cleaning, inspecting, and abandoning the pipeline as the preferred approach, with the exception of the section of pipeline between East River and Highway 348, which would be removed in accordance with PLFN's request.

The Proponent assessed two design options for the bridge replacing the existing causeway: a concrete girder bridge and a steel girder bridge. The concrete girder bridge construction was chosen due to lower maintenance requirements and lower capital cost. The original design included a sidewalk on one side of the bridge; however, the PLFN community indicated during engagement with the Proponent that they would prefer a sidewalk on both sides. The Proponent agreed to incorporate this into the design.

3.2 External Technical Review of Alternatives Assessment

In response to concerns raised by PLFN regarding the Proponent's assessment of waste management alternatives, IAAC commissioned an ETR to analyze the Proponent's assessment of alternative options for the disposal of hazardous waste from a technical and cost perspective, and whether the preferred option would safely dispose of the waste. The ETR considered:

- the quality of the Proponent's methodology and information gathered for the EIS;
- the reasonableness of the impact predictions and final conclusions, based on the available information; and
- the level of risk and/or uncertainty associated with the preferred option for waste disposal.

Overall, the independent experts concluded the Proponent's analysis of alternative waste management options was reasonable. However, the independent experts expressed the following concerns:

- The EIS did not contain sufficient information about why some options were not carried forward in the assessment for further consideration, and therefore it was not possible to determine whether all reasonable options were assessed with the same level of detail.
- There remains uncertainty regarding the design of the containment cell, specifically around its storage capacity and the stability of the side slopes.
- There remains uncertainty about the capacity of the temporary leachate treatment facility to handle the volume of water expected to be produced during the remediation,
- There remains uncertainty about whether the treated water would be capable of meeting applicable water quality guidelines.

PLFN raised similar concerns regarding the alternatives assessment. PLFN expressed that the community's main concern regarding this Project is the modification and expansion of the existing containment cell and that their concerns were not adequately reflected in the EIS. PLFN also stated that the option of off-site disposal to an existing landfill was not adequately explored. Additionally, Nova Scotia Environment and Climate Change expressed concerns about the design and capacity of the containment cell. IAAC understands, through discussions held with Nova Scotia Environment and Climate Change, that detailed design questions and concerns would be addressed through the provincial approval process undertaken pursuant to the Nova Scotia *Environment Act*, should the outcome of the federal EA permit the Project to proceed. It was also noted that the containment cell design must align with the criteria set out in

the Canadian Council of Ministers of Environment (CCME) *National Guidelines for Hazardous Waste Landfills.*

In response to the ETR and PLFN comments, the Proponent provided additional information used to assess the alternative waste management approach, including a letter from Nova Scotia Environment and Climate Change confirming that there are no facilities within Nova Scotia that are approved to accept dioxin and furan impacted waste. The Proponent stated that off-site disposal would require trucking the waste out of province, or permitting a new landfill. The Proponent concluded that this rendered the off-site disposal option technically environmentally, economically, and socially less feasible than the preferred option.

The Proponent also provided an analysis of the technical and economic feasibility of an alternative containment cell location proposed by PLFN. The proposed alternative location was a 29.1-hectare parcel of PLFN-owned land located in Mount William, Nova Scotia, approximately 10 kilometres southwest of the SSA. The Proponent's alternative analysis determined that the parcel of PLFN-owned land would not be a suitable location for a hazardous waste containment cell because it would not meet the requirements of the *Nova Scotia Municipal Solid Waste Landfill Guidelines,*[12] which Nova Scotia Environment and Climate Changes stated were the minimum requirements required for an industrial approval to construct and operate a hazardous waste containment cell. The proposed land would not be able to meet the minimum distance a landfill must be located from water bodies, groundwater, and residential and commercial buildings.

The Proponent indicated that even if a suitable location for the waste was found, moving the containment cell to any other parcel of off-site land would create additional costs and risks because the transportation of the waste would increase noise levels, dust generation, greenhouse gas emissions, and risk of traffic accidents. The Proponent stated that moving the waste to a new location approximately 20 kilometres from the SSA would increase the cost of the Project by $86 to $162 million, due to the number of trucks required. The Proponent also noted that the risks and costs associated with transporting the waste to a new location would increase as the distance from the site increases.

PLFN conducted a desktop analysis[13] identifying 109 Crown land parcels and 97 privately-owned land parcels within 50 kilometres of the Boat Harbour site, that could be considered for the development a new waste containment cell. A further analysis of containment cell suitability for four specific parcels of land (i.e., the existing Boat Harbour containment cell, the Northern Pulp property active waste cell, and the Mount William and Granton properties owned by PLFN) was completed following the same methodology that the Proponent used to assess the Mount Williams property. PLFN concluded that although not all environmental siting criteria would be met by the Mount William property, it meets more of the criteria than the existing containment cell location. PLFN also identified that the Northern Pulp property was the most

[12] Nova Scotia Environment and Climate Change does not currently have guidelines specific to the storage of hazardous waste, however Nova Scotia's *Municipal Solid Waste Landfill Guidelines* were used as minimum guidance to determine whether the proposed land would be a suitable location.

[13] Hive Engineering. 2023. Boat Harbour Remediation Environmental Impact Assessment Information Requirement 82 Analysis. Available at: https://iaac-aeic.gc.ca/050/documents/p80164/155835E.pdf

suitable location as it would meet all environmental siting criteria used in the Proponent's alternatives analysis.

3.3 IAAC Conclusion

IAAC is of the view that the Proponent adequately considered the cost-effectiveness, technical applicability, reliability, environmental effects, and feedback from PLFN, the ETR, federal and provincial experts, and the public in selecting its preferred alternatives for carrying out the Project. IAAC is satisfied with the Proponent's responses to the information requirements regarding the alternatives assessment and containment cell design and agrees with the independent experts that the alternatives assessment process used by the Proponent was reasonable. IAAC recognizes that concerns remain regarding the assessment of alternative waste management options, specifically the location of the containment cell.

IAAC acknowledges that the Proponent would be required to adhere to CCME *National Guidelines for Hazardous Waste Landfills*. The containment cell design concerns raised by independent experts and Nova Scotia Environment and Climate Change reviewers would be addressed through the provincial approval process.

IAAC is satisfied that the Proponent sufficiently assessed the alternative means of managing waste for the purposes of assessing the environmental effects of the Project under CEAA 2012.

4 Consultation Activities and Advice Received

4.1 Crown Consultation with the Mi'kmaq of Nova Scotia

The federal government has a duty to consult Indigenous groups and, where appropriate, to accommodate when there is knowledge that the federal government's proposed conduct might adversely impact Indigenous rights. Indigenous consultation is also undertaken more broadly as an important part of good governance, meaningful policy development, and informed decision-making.

For the EA of this Project, IAAC initiated consultation with the Mi'kmaq of Nova Scotia, 13 First Nation communities as follows: Annapolis Valley First Nation, Bear River First Nation, Eskasoni First Nation, Glooscap First Nation, Membertou First Nation, Millbrook First Nation, Paqtnkek First Nation, Pictou Landing First Nation, Potlotek First Nation, Sipekne'katik First Nation, Wagmatcook First Nation, Wasoqopa'q First Nation, and We'koqma'q First Nation.

On April 25, 2019, the Assembly of Mi'kmaq Chiefs of Nova Scotia passed a resolution, supported by all 13 Mi'kmaq of Nova Scotia communities, to authorize PLFN to lead consultation for the Project, on its behalf. IAAC coordinated the Crown's consultation activities with PLFN and, together with other federal departments, integrated consultation into the EA process. IAAC used a variety of methods including phone calls, emails, letters, and in-person and virtual meetings to provide updates on key developments and to solicit input or feedback from the community.

IAAC invited all Mi'kmaq of Nova Scotia to review and comment on the Summary of the Project Description, draft EIS Guidelines, EIS Summary, and the draft report and draft potential conditions. IAAC informed Mi'kmaq communities of key milestones and participation opportunities throughout the EA process.

PLFN participated on the technical review team with federal and provincial experts, which involved reviewing the EIS with the ability to request additional information from the Proponent and review the responses to these requests. Furthermore, IAAC held regular meetings with Chief and Council to keep them informed as the EA advanced. IAAC hosted two community meetings to explain the EA process, answer questions, and respond to comments. IAAC also participated in two proponent-led workshops in the community to answer members' questions around the EA process.

The main areas of concern raised by PLFN included:

- storage of hazardous waste onsite;
- leakage of hazardous waste back into Boat Harbour; and
- potential effects to drinking water.

IAAC supported PLFN's participation in the EA through its Participant Funding Program. PLFN applied for funding through this program and was allocated $186,600.

Appendix E provides a summary of comments provided by PLFN and Sipekne'katik First Nation during the public comment period of the draft report and potential conditions, and IAAC's responses.

4.2 Indigenous Engagement Activities Organized by the Proponent

Information obtained by the Proponent regarding current use of lands and resources for traditional purposes by PLFN, as well as the Proponent's assessment of the Project's potential effects and impacts on Aboriginal and treaty rights, informed the federal government's consultation exercise. The Proponent engaged and consulted with PLFN, both formally and informally, since 2014. Consultation activities organized by the Proponent include:

- communications by email, letters, and phone calls;
- sharing information and documents;
- virtual and in-person meetings;
- funding a full-time Community Liaison Coordinator from the community; and
- establishing structured committees to facilitate community input.

4.3 Public Participation

4.3.1 Public Participation Led by IAAC

IAAC provided opportunities for the public to comment on the Project Description, draft EIS Guidelines, EIS Summary, draft report, and draft potential conditions (Table 1). Notices of these opportunities were posted on the Canadian Impact Assessment Registry internet site and advertised through local media.

Table 1: Public and Indigenous Consultation Opportunities During the EA

Subject of Consultation	Dates
Project Description	January 7, 2019, to January 27, 2019
Draft EIS Guidelines	April 10, 2019, to May 10, 2019
EIS Summary	December 17, 2020, to January 31, 2021
Draft Report and Draft Potential Conditions	October 15, 2024, to November 14, 2024

IAAC received four comments from the public during the EA. Comments included concerns about: the use of dredging and the storage of hazardous waste on-site; effluent testing procedures involving wildlife; and the potential for effluent from PLFN's sewage treatment plant to enter Boat Harbour after dam removal.

4.3.2 Public Participation Led by the Proponent

Prior to the commencement of the federal EA, the Proponent conducted three public engagement meetings with the broader community to discuss the Pilot Scale Testing Program. These meetings took place on in October 2016, April 2018, and May 2018. Local community groups participated in these events, including Northern Pulp Workforce, Northern Pulp Executive, Environmental Services Association Maritimes, and the Northumberland Fisherman's Association.

The Proponent also indicated its engagement with stakeholders included the provision of information through the Boat Harbour Project website, which was launched in March 2017, in which public stakeholders were invited to submit comments directly through the website, or sent by email or mail. The Proponent also engaged with local media outlets and social media to provide information and updates about the Project.

The Proponent held two public open houses for the Project, on August 1, 2019, and December 10, 2019. Concerns and questions about the Project were generally related to the long-term storage of hazardous waste in the containment cell, the potential for increased odour from the Project, potential effects to groundwater or surface water, the fate of the decommissioned pipeline, future land use, and the importance of the closure of the effluent treatment facility in accordance with the *Boat Harbour Act*. The Proponent has committed to continued community and stakeholder engagement on the Project.

4.4 Participation of Federal, Provincial, and Independent Experts

Federal and provincial departments and agencies with specialist information and expert knowledge relevant to the Project supported IAAC throughout the EA, including participation in IAAC's decision to require a federal EA for the Project, developing the EIS Guidelines, reviewing the EIS, and preparing the draft report and draft potential conditions.

IAAC requested specialist and expert information and knowledge from Fisheries and Oceans Canada, Environment and Climate Change Canada, Health Canada, Transport Canada, Indigenous Services Canada, and the Province of Nova Scotia (in particular on local archeology and wildlife).

Potential federal permits and authorizations include the following:

- The Minister of Transport may approve works in, on, over, under, through or across navigable waters under the *Canadian Navigable Waters Act.*
- The Minister of Fisheries and Oceans Canada may issue authorization(s) under subsection 35(2) of the *Fisheries Act*.
- The Minister of Indigenous Services Canada may issue an access permit to reserve lands under subsection 28(2) of the *Indian Act* upon direction from First Nation Council.

The Minister of Housing, Infrastructure and Communities Canada may provide funding through authority granted under the *Department of Housing, Infrastructure and Communities Act*.

In response to concerns raised by PLFN, IAAC engaged independent experts from outside of government to conduct an ETR to review the Proponent's alternatives analysis for the disposal of hazardous waste. Environment and Climate Change Canada participated along with IAAC in the committee to oversee the ETR.

Their advice and information have been incorporated into relevant sections throughout this document.

5 Predicted Effects on Valued Components

5.1 Fish and Fish Habitat

The Project after applying the proposed mitigation measures could cause residual effects to fish and fish habitat, as defined in the *Fisheries Act*, fish species at risk listed under Schedule 1 of SARA or assessed as "endangered", "threatened", or of "special concern" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and marine plants through fish mortality and injury, effects to water quality, and habitat disturbance and loss.

IAAC is of the view that the Project is not likely to cause significant adverse effects on fish and fish habitat, including fish species at risk and marine plants, after considering the proposed key mitigation measures, monitoring, and follow-up programs. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, and the views expressed by federal and provincial authorities, and PLFN on behalf of the Mi'kmaq of Nova Scotia.

5.1.1 Proponent's Assessment and Views Expressed

Description of the Existing Environment

Freshwater Watercourses and Wetlands

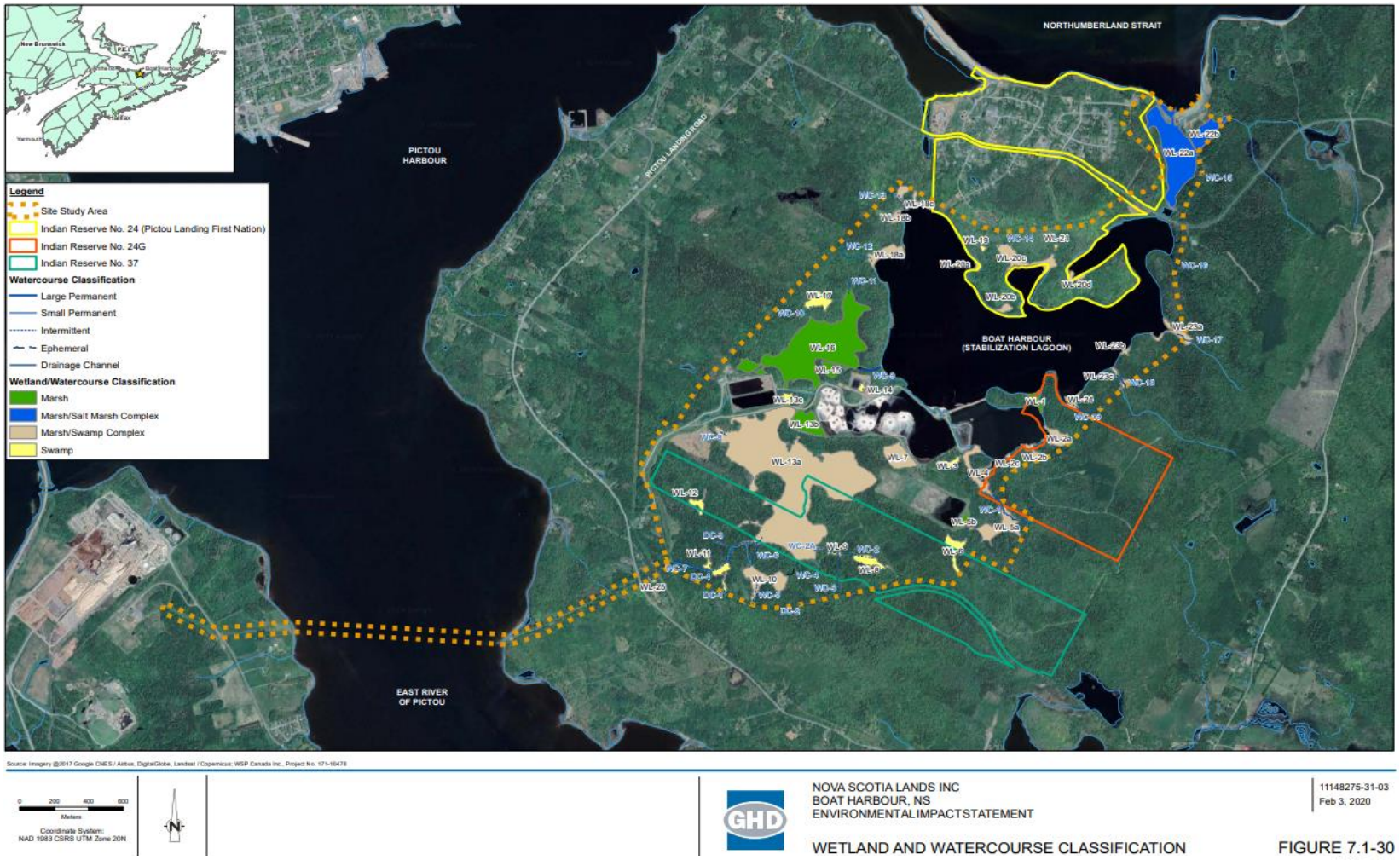
The Proponent identified a total of 19 watercourses within the SSA including three small permanent channels, one large permanent channel, two ephemeral channels, and 13 intermittent channels. Six of the 19 watercourses were dry during the study, and therefore were not assessed further by the Proponent. These watercourses are unlikely to support a significant fish population and would have limited fish productivity due to their small size and periodic drying.

The Proponent stated that the main salmonid species with potential to occur within the SSA are brook trout, however most watercourses within the SSA are not suitable to sustain adult brook trout year-round. Based on the habitat requirements for Atlantic salmon (outer Bay of Fundy population) and brook trout, the Proponent identified six watercourses within the SSA that would be adequate for spawning or rearing during portions of the year.

The Proponent identified 25 wetland areas, including marshes, swamps, marsh/swamp complexes and a marsh/salt marsh complex within the SSA, comprising approximately 86 hectares (16 percent of the SSA), as shown in Figure 7 below. Using the *Canadian Wetland Classification System* and the *Wetland Ecosystem Services Protocol* for Atlantic Canada, the Proponent classified most of wetlands within the SSA as moderate condition but moderately or highly prone to degradation. Generally, the wetlands located further from the effluent treatment facility were less contaminated than those located in the immediate vicinity of the effluent treatment facility. Sediment sampling of the freshwater wetlands showed that the

highest dioxins and furans concentrations were collected from the open water areas of wetlands that were formerly used as settling ponds. The Proponent stated that the fish within Boat Harbour and the directly impacted freshwater watercourses and wetlands within the SSA likely have compromised health.

Figure 7: Wetland and Watercourses within the SSA



Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.1-30.

Figure Description: Watercourses (WC) and wetlands (WL) identified in the SSA.

The estuary is approximately 10.02 hectares and is comprised of marsh/salt marsh complex wetlands (Wetlands 22a and 22b). The estuary directly downgradient of the dam is considered freshwater marsh and becomes increasingly saline towards the channel to the Northumberland Strait which creates a freshwater/saline gradient (i.e., salt marsh) at the mouth of the estuary. The Proponent stated that the freshwater/saline gradient likely limits the resident fish found in the estuary to those tolerant of both brackish and fresh water, such as mummichogs. The water quality of the channel connecting the estuary to the Northumberland Strait was found to exceed[14] applicable screening levels[15] for various general chemistry parameters and dissolved and total metals.

Mummichog and ninespine stickleback were observed in the freshwater areas of the SSA (i.e., the freshwater wetlands and watercourses), as well as in the estuary. Golden shiner was identified in Boat Harbour and the surrounding freshwater wetlands and watercourses but were not identified in the estuary. Two additional fish species (tomcod and white perch) were identified in the estuary but were not observed in the freshwater wetlands or watercourses in the SSA. Striped bass was observed in the estuary which were believed to be migrating in and out of the estuary to feed on mummichogs. The Proponent noted that the estuary is too saline for the survival of striped bass eggs or larvae. No fish species of commercial value were found within Boat Harbour or the surrounding freshwater wetlands and waterbodies. No fish or aquatic species at risk under SARA or COSEWIC were identified within the freshwater watercourses and wetlands of the SSA.

The Proponent stated that contaminant concentrations in fish collected from the SSA met background levels and/or applicable screening levels. Additional information about the contamination of fish, as it relates to human health and country foods, can be found in Section 5.3 (Health Conditions) of this report.

Marine Environment

Soft shell clams, oysters, blue mussels, razor clams, periwinkles, sand dollars, and several seaweed species occur within the marine SSA and LSA, near the mouth of the estuary. This area supports several commercial fisheries, with American lobster, Atlantic herring, rock crab, and American eel being the primary commercial fisheries in the marine RSA. PLFN's most significant commercial activity is fishing, with 23 commercial communal licenses employing approximately 100 people annually. These licenses cover a variety of marine species in the Northumberland Strait, including lobster, snow crab, rock crab, mackerel, herring, and tuna, which are the most commonly harvested species.

The Proponent stated eight COSEWIC-listed aquatic species at risk were identified within the marine SSA and LSA in the sandy substrate of the Northumberland Strait shoreline, near the mouth of the estuary. Of

[14] Exceedances to applicable screening levels included: Cadmium, copper, mercury, sodium, zinc, PHCs, dissolved concentrations of aluminum, cadmium, iron, manganese, magnesium, and sodium, and total metals concentrations of: aluminum, barium, cadmium, copper, iron, magnesium, manganese, phosphorous, sodium, and zinc.

[15] Guidelines protective of human and ecological health through recreational surface water exposure and aquatic life from multiple sources were applied by the Proponent: Nova Scotia Environment *Environmental Quality Standards for contaminated sites (potable water and surface water),* Health Canada's *Guidelines for Canadian Drinking Water Quality*, U.S. Environmental Protection Agency (USEPA) *Regional screening levels for tap water*, *CCME Water quality guidelines, Ontario aquatic protection values*, and USEPA *Region 4 surface water screening values.*

these species, two are listed under SARA: rainbow smelt (endangered) and Atlantic salmon (Inner Bay of Fundy population, endangered). Species at risk with the potential to occupy the marine LSA or marine RSA can be found in Appendix D of this report. No critical habitat is identified. The area of the Northumberland Strait shoreline immediately outside the mouth of the estuary, within the marine SSA, is generally an erosional environment with sand in the nearshore regions, larger rocks and boulders offshore, and a low organic matter content. The embayment area north of the estuary consists of primarily a combination of sand and mud with brown algae and areas of eelgrass. Sediment samples collected from this area in 2003 were below CCME *Interim Sediment Quality Guidelines*. Due to the high production of phytoplankton and periodic resuspension of sediments, the Proponent stated that the Northumberland Strait has high naturally occurring suspended matter. Fisheries and Oceans Canada stated that the Proponent's use of sediment quality data from 2003 may not be appropriate to determine the current sediment quality, as sediment quality and appropriate guidelines may have changed in the past 20 years and recommended that sediment samples from the embayment area north of the estuary and into Northumberland Strait should be collected prior to dam removal.

Aquatic species found in the intertidal zones of Northumberland Strait within the marine RSA are generally limited to shellfish species such as soft-shelled clam, blue mussels, horseshoe mussels, oysters, razor clams, surfclams, and moon snails. Sub-tidal areas also contain these species; however, they are less abundant than in the intertidal areas. Groundfish, pelagics, and finfish are also found in the sub-tidal areas, including flounder species, hake, tomcod, and skates. The hard-bottom areas contain groundfish such as cunners and longhorned sculpins, and is utilized by mackerel, herring, alewife, smelt, American eel, sea-run brook trout, and Atlantic salmon on a seasonal basis.

The Proponent identified several SARA and COSEWIC listed species that have been observed or could potentially be encountered within the marine RSA (Appendix D). A list of all species at risk identified by the Proponent and federal or provincial experts within the marine SSA, LSA and RSA are listed in Appendix C.

Prediction of Effects – Freshwater Watercourses and Wetlands

Fish Mortality and Injury

Fish mortality and injury are predicted to occur within the SSA during remediation activities. The Proponent stated that due to the contamination caused by the historical operations of the effluent treatment facility, the fish within the areas of the SSA to be remediated, excluding the estuary, would be euthanized prior to remediation. Fisheries and Oceans Canada agreed, stating that these fish should be removed from the food chain to prevent potential biomagnification of contaminants. Euthanization would occur annually, prior to dredging and in consultation with Fisheries and Oceans Canada and PLFN on behalf of the Mi'kmaq of Nova Scotia. The Proponent acknowledged that not all fish would be euthanized as some would seek refuge in nearby watercourses. These fish could be negatively impacted due to changes in water quality from the disruption of contaminated sediment, and changes in salinity due to the introduction of tidal influence after the dam is decommissioned.

Fisheries and Oceans Canada stated that direct injury or death of fish from dredging activities in the estuary may also result from the Project. To minimize potential mortality or injury of fish within the estuary during dredging, the Proponent committed to relocating fish to a non-work area prior to starting remediation activities downstream of the dam. After the relocation is complete, a net would be placed at the outlet of

the estuary to prevent fish from entering during dredging. Fisheries and Oceans Canada advised the Proponent that a fish capture and relocation plan would be required as part of the application for a *Fisheries Act* authorization.

Fisheries and Oceans Canada expressed concern that project activities were not scheduled outside the key timing windows of sensitive life history stages for freshwater and anadromous fish species (fish species that spawn in freshwater but spend a portion of their lives in saltwater environments) found within the SSA, and therefore potential effects resulting from overlapping periods were not assessed. The Proponent noted that the timing of dredging activities upstream of the existing dam would not have additional impacts to fish and fish habitat, as fish in these areas would be euthanized prior to dredging. The timing of remediation activities in the estuary would follow recommended timing windows.

Effects to Water Quality

Remediation activities in the freshwater watercourses and wetlands would likely result in localized siltation events, potentially resulting in a release of contaminants from historically impacted sediment, and an increase in concentrations of TSS, total dissolved solids, turbidity, and conductivity. The Proponent stated that these siltation events would be unlikely to cause long-term effects to fish or fish habitat within the SSA due to their localized nature. The removal or disturbance of aquatic vegetation during project activities (e.g., removal of the causeway and dam, and construction of the new bridge) could also temporarily increase erosion and sedimentation in freshwater watercourses and wetlands, potentially impacting the water quality and temperatures. Although this would be an adverse impact to fish and fish habitat within freshwater watercourses and wetlands within the SSA, the Proponent predicts the Project would result in long-term improvements to fish habitat.

Fisheries and Oceans Canada expressed concern that the Proponent did not consider how changes in wetland hydrology from project activities (e.g., dredging, removal of aquatic vegetation, removal of flow control structures) could affect fish and fish habitat. The Proponent acknowledged that the Project would alter wetland hydrology, potentially causing impacts to fish and fish habitat, however, the goals of the Project include improving water and sediment quality and increasing fish access to the SSA. After the dam is removed, the SSA would be hydraulically reconnected to the marine environment, increasing the salinity of the waterbodies within the SSA, and potentially transitioning them to estuarine habitat. The watercourses and wetlands within the SSA would have the potential to be utilized by anadromous fish, which do not currently inhabit the SSA due to the presence of the dam. However, Fisheries and Oceans Canada noted uncertainty with whether anadromous fish populations would have homing capabilities to utilize wetland habitat immediately after remediation. The Proponent stated that an overall increase in species would be expected after remediation, and post-remediation monitoring would be conducted to confirm the extent of the natural colonization of remediated wetlands within the SSA.

To minimize the effects of project activities within the SSA on fish and fish habitat due to changes in water quality, the Proponent proposed mitigation measures to control erosion including maintaining riparian vegetation surrounding fish habitat when possible and using silt curtains to separate active dredging areas from adjacent areas. The Proponent stated that as part of the provincial approval process, a monitoring plan would be developed to verify the performance of control measures during dredging. The Proponent's environmental management plan would also include monitoring to identify increases in TSS concentrations

so that appropriate actions can be taken before TSS concentrations exceed acceptable levels. The Proponent stated that if TSS concentrations begin to approach unacceptable levels, dredging would halt to allow TSS concentrations to decrease, and additional mitigation measures would be developed and implemented.

Habitat disturbance and loss

The Proponent estimated that approximately 27 hectares of the freshwater wetlands would require remediation, which represents approximately 36 percent of the total freshwater wetland area in the SSA. The Proponent stated that the wetland areas identified in the EIS as requiring remediation are preliminary estimates and final extent will be determined when the remedial objectives are finalized during the provincial approval process.

Habitat loss and fragmentation would potentially occur due to the construction or upgrade of the access roads, which would result in the permanent loss of portions of the wetlands. The Proponent stated that a compensation plan for the loss of wetland functions would be submitted to Nova Scotia Environment and Climate Change as part of the provincial approval process and would outline restoration of existing degraded wetlands in the SSA and/or creation of new wetlands in a nearby area.

The Proponent stated that approval from Indigenous Services Canada, which requires a Band Council Resolution from PLFN, is required for any disturbance that occurs on Indian Reserve land. Environment and Climate Change Canada stated that due to the potential loss of a small portion of wetland occurring on federal lands (Indian Reserve No. 37), the Proponent must meet the goals of the *Federal Policy on Wetland Conservation* when developing the wetland compensation plan.

The Proponent estimated that the total area of the estuary to be remediated would be 1.69 hectares, representing almost 17 percent of the estuary. Dredging the estuary would result in temporary habitat loss and alteration due to the removal of marine plants and contaminated sediment. The Proponent predicted that although temporary habitat loss would occur within the estuary, the habitat quality would improve overall due to the Project through the re-establishment of tidal wetland conditions and removal of contamination. Fisheries and Oceans Canada noted that the Proponent did not adequately describe the benthic habitat within the estuary, which would be impacted by dredging and increases in TSS, therefore there are uncertainties about the species present in these areas and how they may be impacted by the Project.

In addition to habitat loss, the Proponent stated that noise and vibrations from increased traffic and use of heavy machinery for all phases of the Project would potentially result in temporary disturbance to fish species, which may seek out alternate habitat.

Significance of Residual Effects – Freshwater Watercourses and Wetlands

The Proponent predicted that potential residual effects to fish and fish habitat in the freshwater watercourses and wetlands would not be significant, given the mitigation, follow-up, and monitoring measures proposed. The Proponent predicted that the effects to fish and fish habitat within the SSA due to impacts to the freshwater watercourses and wetlands caused by site preparation activities, dredging activities, and the removal of the dam would be generally low to moderate in magnitude, short- to medium-

term in duration, and reversible. Aquatic species at risk were not observed within Boat Harbour or the associated wetlands or watercourses, therefore adverse impacts to aquatic species at risk within the freshwater watercourses and wetlands are not anticipated.

The death of fish, whether by direct impacts from dredging activities, or from euthanasia, would be considered moderate to high magnitude. However, the fish in the SSA are thought to have compromised health, and the remediation of Boat Harbour and surrounding lands would result in overall positive impacts to fish and fish habitat within the SSA, due to the improvement of water quality. The Proponent concluded that with the implementation of the proposed mitigation measures, residual effects to fish and fish habitat due to fish mortality and injury, effects to water quality, and habitat disturbance and loss would not be significant.

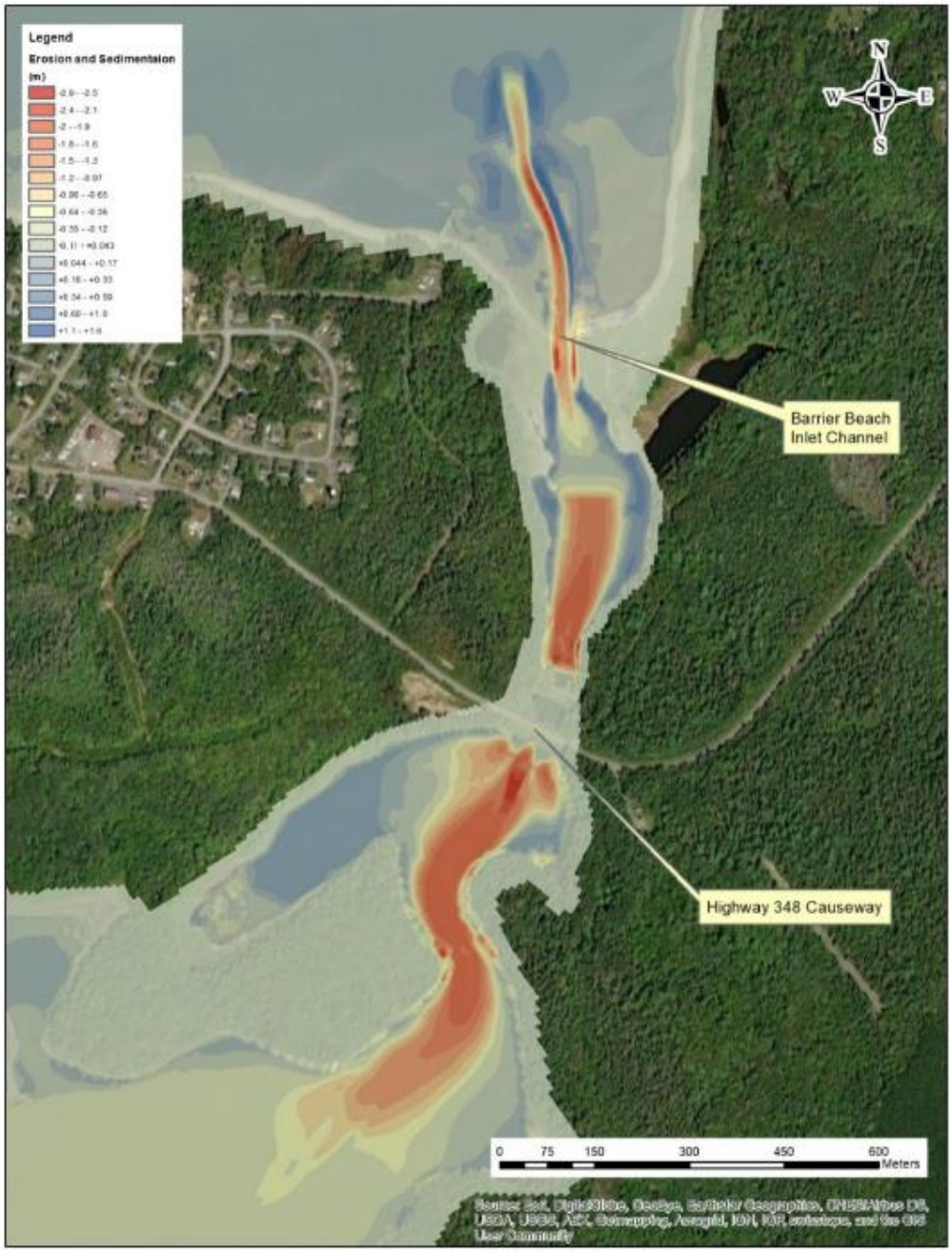
Prediction of Effects – Marine Environment

Water Quality Effects

Following remediation activities, the dam would be removed to allow the introduction of tidal influence into Boat Harbour. Upstream and downstream cofferdams would be put in place to create “in the dry” conditions for the necessary work to dismantle the dam; after the dam structure is removed, the cofferdams would also be removed. The reintroduction of tidal action to Boat Harbour would cause bottom scouring and sediment resuspension, which would result in sediment transport into the Northumberland Strait. The Proponent’s hydraulic modeling predicted that approximately 270,000 cubic metres of suspended solids (composed mainly of clay, silt, and sand) would be mobilized by the tidal action, with a portion settling on the seafloor near the estuary and the Northumberland Strait shoreline immediately outside of the mouth of the estuary (Figure 8). The Proponent predicted that the resuspension of these solids and the resulting TSS concentrations would decline over a period of months due to settling, dispersion, and dilution.

PLFN raised concerns about the potential impacts to commercial and PLFN fisheries from the release of contamination into the Northumberland Strait, as well as the potential of bioaccumulation of these contaminants. The Proponent stated that any discharges from the SSA into the Northumberland Strait would meet applicable discharge criteria. Furthermore, the Proponent predicted that COPC concentrations in surface water would be below the applicable guidelines for the protection of human health and ecological receptors (including fish), and a surface water quality and country foods monitoring program would be implemented to confirm this prediction.

Figure 8: Cumulative Erosion and Sedimentation One Year Following Dam Removal



Source: Boat Harbour Remediation Project, Round 1 Information Request Responses, Figure 9.

Figure Description: Model showing cumulative erosion (in red) and sedimentation (in blue) one year following dam removal, within the estuary and mouth of the estuary into Northumberland Strait.

The Proponent stated that while the sediment transport model predicted that the average daily TSS concentrations immediately after dam removal would be about ten times higher than the applicable CCME *Water Quality Guidelines for the Protection of Aquatic Life (marine)* guideline threshold, and it would fall below that threshold within 140 days. Fisheries and Oceans Canada disagreed with the Proponent's selection of the applicable CCME guideline thresholds. The Proponent stated it would regularly confirm model assumptions and outputs along with effects predictions by completing marine habitat surveys and monitoring of TSS and sediment deposition/flux in the Northumberland Strait embayment area north of the estuary (pre- and post-dam removal).

Fisheries and Oceans Canada, Environment and Climate Change Canada, and provincial experts raised concerns about the elevated TSS concentrations predicted to enter the Northumberland Strait. The Proponent conducted modeling of alternative remediation scenarios (including enlarging the passage downstream of the dam and/or the inlet channel near the mouth of the estuary to the original shoreline positions and armouring and adding embankment protection to these areas) to determine if TSS concentrations resulting from the removal of the dam could be reduced. This modeling indicated that armouring the estuary channel bed with gravel prior to dam removal would provide protection against bottom scouring and reduce TSS concentrations entering the Northumberland Strait by over 50 percent compared to the initial model. While acknowledging the potential reduction in TSS from the specific mitigation measure, Fisheries and Oceans Canada stated the area modeled by the Proponent (i.e., the model domain) was too small, therefore there is still a large quantity of sediment (70,000 cubic metres) with an unknown endpoint. The Proponent stated that most of the modeled area of the embayment area of the estuary is predicted to have a net deposition of between four and 10 centimetres (Figure 8). The Proponent indicated that the thickness of sediment modeled to be deposited in the embayment area of Northumberland Strait would be similar to natural conditions and would not significantly impact the marine environment. Fisheries and Oceans Canada stated they could not agree with the Proponent's conclusion, noting that the survival rate of eelgrass, a sensitive benthic habitat, may be dependent on the plant heights in these areas, and the full extent of impacted habitats and species was not assessed by the Proponent. The Proponent indicated that conducting the dam removal in late fall or early winter could further reduce the potential impacts to fish and fish habitat by avoiding ecologically sensitive breeding and migration windows, and would reduce shading effects on aquatic plants, as during these times photosynthesis is minimal and TSS concentrations are naturally elevated. The Proponent also committed to removing the dam outside of commercial fisheries seasons in the Northumberland Strait, which usually run from April to late November. Fisheries and Oceans Canada agreed that this timing would potentially reduce shading effects compared to if the dam was removed in the spring or summer season; however, there would still be an increase in shading effects from natural conditions and it is possible that shading effects could extend into the spring and summer.

Fisheries and Oceans Canada noted that comprehensive field-based benthic habitat data for the estuary, including the Northumberland Strait embayment area north of the estuary, would be required to accurately assess the impacts of dredging and increases in TSS. This information would be required for a *Fisheries Act* authorization and would inform appropriate measures to offset any destroyed fish habitat from dredging as well as any altered or disrupted habitat from sediment deposition. Fisheries and Oceans Canada noted the estuary is a brackish/marine environment where eelgrass could potentially be found and in the absence of data, the Proponent should assume these areas contain sensitive benthic habitat (e.g., eelgrass). The Proponent committed to completing a detailed monitoring program prior to removing the dam. As part of

this program, underwater benthic habitat surveys would be conducted with an emphasis on mapping and delineating seagrass (including eelgrass) beds. Fisheries and Oceans Canada recommended the monitoring program also include the characterization of substrate type(s). Nova Scotia Department of Fisheries and Aquaculture advised IAAC that the commercial fishing industry expressed concerns with potential impacts of the Project on water quality. The Proponent stated that removing the dam in late fall or early winter would reduce potential impacts to commercial fisheries by avoiding commercial fishing and harvesting seasons.

Significance of Residual Effects – Marine Environment

The Proponent predicted that residual effects to fish and fish habitat within the marine environment would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Residual effects to fish and fish habitat would occur within the marine SSA, LSA, and RSA, be short-term in duration, and reversible. Fisheries and Oceans Canada disagreed with the Proponent's prediction, stating the effects to nearby marine habitats were not adequately assessed. Fisheries and Oceans Canada is of the view that the duration of the effects would be medium-term and may be irreversible if eelgrass habitats are adversely impacted.

5.1.2 IAAC Analysis and Conclusions

Analysis of the Effects

Analysis of Effects within Freshwater Watercourses and Wetlands

IAAC acknowledges that the purpose of the Project is to remediate the SSA, a contaminated site, and provide long term improvements to fish and fish habitats. IAAC acknowledges that the Project after applying mitigation measures, will result in localized residual adverse effects on fish and fish habitat due to dredging activities, as these activities would result in habitat loss and disturbance, and the degradation of water quality due to the disturbance of contaminated sediment. Effects of erosion and siltation will be minimized by maintaining a buffer of undisturbed vegetation around all fish-bearing watercourses or wetlands, when practicable. If project activities are required within this buffer, the Proponent will be required to limit rutting, water flow diversion, and sedimentation by implementing measures such as using weight-distributing materials under machinery and floating equipment while conducting these activities. Erosion and siltation control measures such as the use of silt curtains to isolate the active dredging area would minimize the mobilization of sediment to surrounding areas.

IAAC recognizes that prior to starting remediation activities, all fish encountered in Boat Harbour and the directly impacted freshwater wetlands and watercourses would be euthanized, and fish encountered in the estuary would be captured and relocated to a non-work area. IAAC concurs with the Proponent and Fisheries and Oceans Canada that the fish located in Boat Harbour and surrounding freshwater waterbodies in the SSA are likely genetically compromised and removing these individuals from the food chain will reduce the potential for bioaccumulation and biomagnification of contaminants in predator species consuming these fish. The Proponent is required under the *Fisheries Act* to obtain authorization from Fisheries and Oceans Canada for the euthanasia of fish, which would require the Proponent to adhere to specific conditions for approval. The Proponent will be required to prepare a plan for the

euthanization of fish in the directly impacted freshwater waterbodies in the SSA including Boat Harbour, and a capture and relocation plan for fish in the estuary.

IAAC acknowledges that the extent of wetlands directly impacted by the Project is based on preliminary remedial objectives which will be finalized during the provincial approval process under the Nova Scotia *Environment Act*. The Proponent will be required under the Nova Scotia regulatory process to develop a sediment sampling procedure to be implemented during remediation activities to ensure remedial objectives are met in each area undergoing remediation, prior to moving to the next area.

Nova Scotia Environment and Climate Change stated that the Proponent will be required to develop a wetland compensation plan to offset any wetland function loss resulting from the Project by restoring existing degraded wetlands on-site and/or creating new wetlands in a nearby area. IAAC acknowledges the Proponent will also work with Environment and Climate Change Canada to ensure that the mitigation hierarchy for wetland compensation is implemented in a manner that is compatible with the *Federal Policy on Wetland Conservation* if there are impacts to wetlands occurring on federal lands. IAAC acknowledges that if project activities on Indian Reserve property is required, approval from Indigenous Services Canada, which includes a Band Council Resolution from PLFN, will be required.

IAAC agrees with Fisheries and Oceans Canada that the Project will alter the composition of fish species within the SSA and LSA after removal of the dam and restoration of tidal influence. IAAC acknowledges that an objective of the Project is to reintroduce tidal influence to Boat Harbour, which will result in water quality conditions not suitable to the species currently inhabiting the freshwater or brackish (i.e., the estuary) areas of the SSA.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, the magnitude of residual effects assessed on fish and fish habitat is considered to be moderate to high, and effects will be limited to the SSA. The duration of these effects would be short- to medium-term, and partially reversible. After the SSA is remediated and vegetation returns, fish habitat within the SSA would be expected to improve in the long-term due to the removal of contaminated sediment. Any areas of permanent habitat loss, such as wetland areas removed due to the construction of the access road, would be counterbalanced by the anticipated improvement to fish habitat within the SSA, and by the implementation of a wetland compensation plan.

Analysis of Effects within Marine Environment

IAAC acknowledges that in addition to remediating the SSA, a purpose of the Project is to restore tidal influence to Boat Harbour, as it was before Boat Harbour was isolated from the marine environment to be utilized as part of the effluent treatment facility. To achieve this objective, the dam structure will be removed which may result in effects on water quality within the marine SSA, LSA, and RSA due to elevated levels of TSS. The removal of the dam will result in an increase of water flow scouring to the bottom of the estuary and Boat Harbour as tidal flows are re-established. Sediment deposition will occur after the dam is removed and tidal influence is restored, which could impact fish and fish habitat, including sensitive benthic habitat such as eelgrass, which provides important nursery habitat for many aquatic species and is known to occur in the marine RSA. To reduce these impacts, the Proponent will implement scour protection measures in the estuary channel to reduce TSS concentrations entering the marine environment and will schedule the dam removal to avoid sensitive periods to the satisfaction of Fisheries

and Oceans Canada. IAAC acknowledges that any impacts to fish and fish habitat in the marine environment would also potentially impact commercial and PLFN fisheries, therefore the timing of dam removal activities should also be developed in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia[16], commercial fishers, and other relevant stakeholders.

IAAC acknowledges that there are limitations in the sediment transport model predictions provided by the Proponent which has resulted in uncertainty about when TSS levels will reach equilibrium and fall below CCME guidelines. IAAC also acknowledges there are concerns about potential impacts to water quality and sensitive benthic species due to the limitations of the sediment transport model predictions, as well as the lack of adequate benthic habitat data in the marine LSA. To address these uncertainties, prior to removal of the dam, the Proponent is required to conduct sediment transport modeling to verify predictions for sediment deposition in the Northumberland Strait due to the removal of the dam. In doing so, the Proponent will be required to use an appropriate model domain, identified in consultation with Fisheries and Oceans Canada. The Proponent will also be required to conduct a monitoring program pre- and post-dam removal, which will include monitoring water quality, including TSS concentrations, and sediment deposition and flux in the Northumberland Strait embayment area north of the estuary, including areas identified as sensitive benthic habitat, to confirm predictions and determine if modified or additional mitigation measures are required. IAAC acknowledges that Fisheries and Oceans Cananda can not authorize the death of fish by means other than fishing, or the harmful alteration, disruption, or destruction of fish and fish habitat after it has occurred and highlights the importance of addressing these uncertainties prior to the removal of the dam. IAAC also highlights the importance of follow-up and monitoring for TSS concentrations to verify the accuracy of the EA, verify the effectiveness of mitigation measures, and to inform the need for contingency measures. IAAC recommends the required key mitigation measures, including potential armouring of the estuary, and the timing and process for dam removal, are developed in consultation with Fisheries and Oceans Canada, Environment and Climate Change Canada, PLFN on behalf of the Mi'kmaq of Nova Scotia, and commercial fishers. Transport Canada noted that armouring the estuary may require approval under the *Canadian Navigable Waters Act.* While mitigation including armouring the estuary would decrease the TSS concentration, IAAC acknowledges there are still uncertainties with regards to impacts to fish and fish habitat in the marine environment.

IAAC notes that the estuary and a portion of seabed north of the estuary have already been impacted by the historical operation of the effluent treatment facility. The Project will include the remediation of contaminated sediments by dredging portions of the estuary bottom, reducing the likelihood that sensitive habitats would be impacted by the mobilization of contaminated sediments after the removal of the dam. IAAC notes that critical habitat required for the survival of aquatic species at risk was not identified in the marine LSA or RSA. IAAC notes that a fish habitat offsetting plan would be required as part of the Proponent's application for authorization under the *Fisheries Act*. In addition, the Proponent would be required to comply with Section 36 of the *Fisheries Act*, administered by Environment and Climate Change Canada, which prohibits the release of deleterious substances into water frequented by fish.

[16] For the purposes of clarity, in this report IAAC explicitly acknowledges effects to PLFN as the Mi'kmaq community adjacent to the Project as well as the broader community of the Mi'kmaq of Nova Scotia who collectively claim Nova Scotia as their traditional territory.

Given the definitions of the environmental effects rating criteria in Appendix A, IAAC is of the view that in the long-term, the Project will result in an overall improvement to fish and fish habitat in the marine environment due to the removal of contaminated sediments in the estuary, and the reconnection of Boat Harbour to the marine environment, potentially resulting in improvements to existing fish habitat, and the creation of new fish habitat. The magnitude of any adverse effects to fish and fish habitat due to marine habitat loss and alteration would be low to moderate. IAAC notes that the final removal of the dam would result in release of sediment to the marine environment. The frequency of the residual effects due to the release of sediment into the marine environment would be continuous, reflecting the tidal influence on TSS concentrations. IAAC agrees with Fisheries and Oceans Canada that the duration of effects to the benthic habitat would be of medium term because TSS concentrations could take one to five years to return to baseline water quality concentrations and partially-reversible to reflect a cautionary approach in the context of uncertainty whether eelgrass habitat could be returned to baseline. Additional mitigation related to the gradual release of water from the dam, prior to its ultimate dismantling and removal, will be required should TSS levels exceed those predicted by the Proponent. Furthermore, the need for additional modeling confirming the geographic extent of sediment transport and deposition will provide further certainty. The Proponent will be required to work with Fisheries and Oceans Canada on the requirements for a *Fisheries Act* authorization, including fish habitat offsetting.

IAAC acknowledges the uncertainty with respect to the geographic extent of sediment transport, and how productive the waters within the marine LSA will become. Though effects to fish and fish habitat are expected, which would potentially result in effects to commercial and PLFN fisheries, IAAC recognizes that the impacts are likely to be temporary and will be mitigated by the Proponent's proposed mitigation measures and the key mitigation measures identified below.

Conclusions

IAAC is of the view that the Project is not likely to cause significant adverse effects on fish and fish habitat, taking into account the implementation of the mitigation, follow-up, and monitoring measures proposed by the Proponent and the key mitigation measures described below.

Key Mitigation Measures and Monitoring to Avoid Significant Effects and Follow-Up Program Requirements for Fish and Fish Habitat

IAAC considers the following mitigation measures, monitoring, and follow-up programs to be necessary to ensure the Project is not likely to cause significant adverse effects to fish and fish habitat. IAAC is of the view that these key mitigation measures would also mitigate effects to aquatic species at risk and are necessary for meeting IAAC's section 79 obligations under SARA. The following key mitigation measures[17] are based on mitigation measures, monitoring, and follow-up programs proposed by the Proponent, expert advice from federal authorities, and comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia.

[17] For the purposes of its analysis with respect to mitigation measures and follow-up requirements in this report, IAAC has assumed that the arrangement by which PLFN leads on behalf of the Mi'kmaq of Nova Scotia will continue.

Key Mitigation Measures

Freshwater Watercourses and Wetlands

- Prior to any Project activity requiring the removal of fish habitat in the SSA, establish and implement a protocol for the euthanization of fish in Boat Harbour and fish-bearing wetlands and the capture and relocation of fish in the estuary that would be impacted by the Project, in a manner that complies with any authorization issued under the *Fisheries Act*, in consultation with Fisheries and Oceans Canada and PLFN on behalf of the Mi'kmaq of Nova Scotia. In consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, the Proponent will identify opportunities for PLFN and the Mi'kmaq of Nova Scotia to participate during the euthanization and capture and relocation of fish.
- Maintain a minimum 15-metre buffer of undisturbed vegetation around all fish-bearing waterbodies within and adjacent to the SSA. The buffer will be maintained during all phases to limit disturbance, in accordance with any provisions and prohibitions authorized under the *Fisheries Act*. If project activities are required within 15 metres of fish-bearing waterbodies, use weight-distributing materials under machinery and floating equipment to limit rutting, diversion of water flow and sedimentation while conducting these activities.
- Conduct activities, including dam removal activities, in or near fish-bearing waterbodies that are located downstream of the dam, outside of any critical periods as defined by Fisheries and Oceans Canada's *Timing Windows to Conduct Projects In or Around Water,* unless otherwise authorized by Fisheries and Oceans Canada.

Marine Environment

- Prior to dam removal, develop measures to control erosion and sedimentation within the SSA resulting from dam removal activities and the introduction of tidal influence to Boat Harbour. Measures will be developed in consultation with Fisheries and Oceans Canada, Environment and Climate Change Canada, and relevant authorities, in a manner consistent with the *Fisheries Act* and its regulations, and taking into account Fisheries and Oceans Canada's *Measures to Protect Fish and Fish Habitat*, including the following:
    - implement energy dissipation measures to control flows and sediment transport, such as operating water control components in a manner that manages the release of water and controls sediment transport until the point of full opening and dismantling the dam, and during dam removal activities, dismantle the dam and water control structures in a step-wise manner that manages the release of water;
    - install armour throughout the estuary prior to dam removal to minimize scouring, unless it is otherwise determined in consultation with Fisheries and Oceans Canada that alternative measures are more effective at reducing scouring, based on the results of sediment and transport and deposition modelling;
    - conduct dam removal in the late fall or early winter season to avoid potential TSS impacts during sensitive timing windows, including fishing and harvesting seasons for current use of lands and resources by PLFN and the Mi'kmaq of Nova Scotia, as determined by PLFN on behalf of the Mi'kmaq of Nova Scotia.

- Prior to the removal of the dam and in consultation with Fisheries and Oceans Canada, and Environment and Climate Change Canada, conduct modelling of sediment transport and deposition in the Northumberland Strait due to the removal of the dam and the return of tidal influence.
  - identify appropriate modeling parameters, including the area to be modeled (i.e., model domain), in consultation with Fisheries and Oceans Canada,
  - in consultation with Fisheries and Oceans Canada and Environment and Climate Change Canada, identify scenarios to be modeled. Identify any dam removal approaches or mitigation measures that could minimize sediment transport and deposition and incorporate these into additional modeling scenarios. Modelling scenarios should include, but are not limited to, dismantling of the dam gradually over various time scales and the use of armouring,
  - based on the results of the modeling, determine which dam removal approach will be used, and whether additional mitigation measures are required to mitigate effects of returning tidal influence to fish and fish habitat in the Northumberland Strait, and if so, implement them. The Proponent shall submit these measures to IAAC prior to implementing.
- Develop and implement fish habitat offsetting plan(s) to the satisfaction of Fisheries and Oceans Canada, to offset effects from the harmful alteration, disruption, or destruction of fish habitat, and death of fish associated with the carrying out of the Project. If any proposed offsetting measures may cause adverse environmental effects not considered in the EA, develop and implement, in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and relevant authorities, measures to mitigate those effects. Submit these measures and the approved offsetting plan to IAAC prior to implementation.
- Collect and treat leachate from the containment cell, and treat contact water in Boat Harbour as necessary, in accordance with the pollution prevention provisions of the *Fisheries Act* and any other applicable regulatory or legislative requirements, prior to being released into the estuary.

Follow-up and Monitoring

IAAC considered the follow-up and monitoring plans proposed by the Proponent, advice from federal and provincial authorities, and comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia in identifying the following follow-up programs necessary to verify the predictions of the EA and the effectiveness of mitigation measures.

- Develop, prior to dam removal and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Fisheries and Oceans Canada, Environment and Climate Change Canada, and any other relevant authorities, a follow-up program to verify the effects from removal of the dam on water quality and sediment deposition as predicted in sediment deposition modelling. As part of the follow-up program, the Proponent will:
  - monitor surface water quality, including TSS and sediment deposition extent and thickness prior to dam removal, and continue through post-closure. Monitoring will occur in the estuary and the Northumberland Strait embayment area north of the estuary, and in areas identified as sensitive benthic habitat;
  - monitor benthic habitat at locations, and for species, determined in consultation with Fisheries and Oceans Canada and any other relevant authorities. Monitoring should begin prior to dam removal and continue through post-closure.

Additional mitigation measures, monitoring, and follow-up programs applicable to project-related effects to fish and fish habitat can be found in the following sections of this report: Migratory Birds (Section 5.2), Health Conditions (Section 5.3), and Accidents and Malfunctions (Section 6.1).

5.2 Migratory Birds

The Project after applying mitigation measures, could cause residual adverse effects on birds and their eggs, nests, and habitat, including migratory birds, as defined in the *Migratory Birds Convention Act, 1994,* listed under Schedule 1 of SARA or assessed as "endangered", "threatened", or of "special concern" by COSEWIC, through habitat loss, sensory disturbance, and changes in mortality risk.

IAAC is of the view that the Project is not likely to cause significant adverse effects on migratory birds or migratory bird species at risk, after taking into account the proposed key mitigation measures, monitoring, and follow-up programs. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, and the views expressed by federal and provincial authorities, and PLFN on behalf of the Mi'kmaq of Nova Scotia.

5.2.1 Proponent's Assessment and Views Expressed

Description of the Existing Environment

Migratory Birds

Over 100 migratory bird species identified and protected by the *Migratory Birds Convention Act*, 1994 were identified within the SSA. Seven main types of forest habitats were identified in the SSA: softwood, eastern hemlock, red pine, tolerant hardwood, intolerant hardwood, mixed, and regeneration. The SSA is also comprised of other habitat types, such as fallow pasture lands, open fields and wetlands.

The Proponent indicated that most bird species associated with the SSA have nesting periods extending from mid-April to late August. However, there are a few species with breeding periods that may occur outside the typical nesting period, including the pine siskin (can nest to late September) and red crossbill (can nest any time but usually in the winter when coniferous cone crops are available).

Migratory Bird Species at Risk

Eight migratory bird species listed as endangered, threatened, or of special concern under Schedule 1 of SARA were identified within the SSA.[18] Three migratory bird species assessed as "threatened" by COSEWIC but not listed under SARA, were also identified in the RSA. No critical habitat required for bird

[18] This includes piping plovers which have not been observed in the SSA since 1991. The Proponent predicted this could be due to an increase in human disturbance to nearby beach areas.

species at risk was identified in the SSA. Species at risk with the potential to occupy the SSA, LSA, or RSA can be found in Appendix D of this report.

Prediction of Effects

Loss of Migratory Bird Habitat

Habitat loss due to the Project would be limited to the SSA. Less than four hectares of permanent habitat loss would result from the widening of the existing access road and construction of an access road surrounding the containment cell. Approximately 70 hectares of habitat would be lost on a temporary basis due to project activities including vegetation clearing for the construction of access roads, clearing around wetlands, and wetland dredging. The Proponent anticipates temporary habitat removal would primarily be restored through natural revegetation. The areas of suitable migratory bird habitat that would be permanently or temporarily lost or gained, can be found in Table 2. Proactive revegetation (e.g., replanting or reseeding) would be used to accelerate the reestablishment of vegetation including along edges of the wetlands and estuary. Wetland 13a may encroach on federal lands (Indian Reserve No. 37),[19] however the extent of dredging required is a preliminary estimate, as described in Section 5.3 (Health Conditions).

Approximately five hectares of potential migratory bird habitat would be created with the removal of the settling basins and pilot scale testing treatment pad. In addition, the Proponent anticipated that removal of contaminated sludge would improve surface water quality in the SSA, which would potentially result in a long-term increase in available bird habitat.

[19] Also referred to as Boat Harbour West 37, a Mi'kmaq reserve used solely by PLFN.

Table 2. Predicted Change in Area of Suitable Migratory Bird Habitat within the SSA

Habitat Loss or Gain	Project Activity	Habitat Loss or Gain (hectares)	Percent of SSA Lost/Gained[20]	Temporary or Permanent Loss/Gain
Loss	Forested Habitat			
	Widening of the access road	0.72	0.18	Permanent
	Clearing around containment cell for access road construction	3.0	0.74	
	Wetland Habitat (areas with dredging include open water)			
	Clearing around wetlands	38	9.5	Temporary
	Dredging of the former settling pond (Wetland 13a)	23	5.7	
	Dredging of the former settling basin (Wetland 16)	8.6	2.1	
Gain	Upland Habitat			
	Removal of settling basins	3.8	0.94	Permanent
	Removal of pilot scale treatment pad	1.3	0.33	

Table Description: Predicted permanent and temporary migratory bird habitat loss or gains in the SSA due to project activities.

The Proponent is required to submit a wetland compensation plan to Nova Scotia Environment and Climate Change to compensate for the loss of wetland functions, which is discussed further in Section 5.1 (Fish and Fish Habitat) of this report. Environment and Climate Change Canada advised that that the wetland compensation plan must be implemented before any loss of wetland occurs, and consider both the permanent and temporary losses of wetland functions used by migratory bird species at risk.

[20] The total amount of migratory bird habitat in the SSA is estimated to be 405 hectares, which is the total area of the SSA (546 hectares) excluding Boat Harbour (141 hectares) which is not migratory bird habitat.

Environment and Climate Change Canada also noted that any activities resulting in modifications to water levels, such as remediation activities in the wetlands, or the removal of flow control structures (e.g., the dam, berms) must be avoided during the bird nesting season. These activities may adversely affect ground-nesting migratory birds, including species at risk (e.g., common nighthawk, bank swallow) and their nests in the SSA due to potential flooding or drying out of the wetlands or estuary. Environment and Climate Change Canada also noted that although there is no critical habitat identified for migratory bird species at risk overlapping the SSA, wetland habitats within the SSA are likely used by species at risk for foraging, roosting, and staging habitat.

Overall, the Proponent stated that while habitat loss has the potential to affect both migratory and breeding birds that use the SSA, the remediation activities are expected to result in long-term improvements to migratory bird habitat quality due to the expected reduction of contamination levels in water and sediment.

Sensory Disturbance to Migratory Birds

The Project may cause increases to noise and light within the SSA during site preparation, remediation, and closure, potentially extending to the LSA and RSA. Sensory disturbance from the increased presence of workers and heavy machinery has the potential to negatively affect acoustic communication, cause avoidance behaviour, and alter reproductive success for migratory birds. Migratory birds may be attracted to or become disoriented by night-time lighting, including the streetlights on the new bridge, potentially altering their behaviours. The Proponent committed to ensuring that equipment meets industry standards to minimize sensory disturbance, and that lights are installed in a manner that reduces light pollution (e.g., downward facing and motion sensing, where appropriate), which would be outlined in the Proponent's environmental management plan. Environment and Climate Change Canada recommended in addition to facing lighting downwards at night, only the minimum amount of lighting required for project activities should be used.

The Proponent predicted that, following the implementation of mitigation measures, residual effects to migratory birds and bird species at risk, sensory disturbance due to increases in traffic, heavy machinery operation, and demolition activities, would not be significant.

Changes in Mortality Risk to Migratory Birds

The Project may increase the risk of mortality to migratory birds during site preparation, remediation, and closure due to collisions resulting from an increase in traffic, heavy machinery operation, demolition activities, or due to changes in water quality.

To reduce the risk of vehicular collisions with wildlife, the Proponent proposed implementing reduced site speed limits in the SSA and posting signage on site to increase worker's awareness of birds, including species at risk, in the area.

Nova Scotia Department of Lands and Forestry noted that the Proponent identified barn swallow nests in a treatment building that would be demolished. Although the nests were not active, there is a possibility that barn swallows could re-establish nesting in the treatment building prior to decommissioning activities. The Proponent stated that whenever possible, vegetation clearing, remediation activities (e.g., dredging, excavation), and demolition activities would be avoided during nesting seasons to minimize the effects of

project activities on migratory birds. To discourage bank swallows and other ground-nesting or burrow-nesting birds (e.g., common nighthawk) from nesting in work areas, the Proponent stated that any large piles or patches of bare soil would be covered during the nesting season. Environment and Climate Change Canada noted that birds and nests are protected until the young have naturally fledged and recommended that if demolition activities can't be avoided during the migratory bird breeding season, surveys targeting barn swallows (and if suitable habitat is present, chimney swift) should be conducted to identify if there is evidence of nesting. If a nest is discovered, any activities that could cause the nest to be abandoned or destroyed should be avoided until any chicks have fledged and left the area or, for migratory bird species at risk listed under Schedule 1 of SARA, until the nest (i.e., residence) is no longer protected under SARA, whichever is later.

Where scheduling project activities outside of the nesting season is not possible, the Proponent committed to developing a pre-clearing nesting bird survey and mitigation plan in consultation with Environment and Climate Change Canada and relevant provincial authorities. Environment and Climate Change Canada advised that conducting project activities such as clearing, remediation, and demolition activities within nesting season does not align with the prohibitions of the *Migratory Bird Convention Act*, and these activities should be avoided during nesting season. Environment and Climate Change Canada noted that although nest surveys may be successful in simple habitats such as previously cleared areas or structures, nests in complex habitats are difficult to locate and nest surveys are not recommended. Environment and Climate Change Canada recommended that prior to clearing, remediation, or demolition activities that cannot avoid nesting periods, non-intrusive survey methods should be used under the direction of a qualified individual[21] to determine whether migratory birds are breeding in these areas, and to identify residences protected under SARA. The Proponent (under the direction of a qualified individual) would be required to delineate and implement set-back distances for any nests identified, in which clearing, remediation, and demolition activities will be avoided.

Environment and Climate Change Canada noted that migratory birds listed on Schedule 1 of the *Migratory Birds Regulations,* such as the pileated woodpecker and great blue heron which have been observed within the SSA, have year-round nest protection. Environment and Climate Change Canada noted that the SSA contains suitable habitat for both of these species, and recommended the development of additional measures to protect any nests that extend beyond the general nesting window. Environment and Climate Change Canada noted that nests of Schedule 1 species cannot be disturbed or destroyed unless under authorization of *Migratory Birds Regulations* permit, or unless an unoccupied nest is reported to the Minister of Environment and Climate Change Canada and remains unoccupied by any migratory bird for the duration of the designated waiting period specified in Schedule 1.

The temporary relocation of existing waste from the containment cell to the settling basins or the aeration stabilization basin may result in the contamination of surface water frequented by migratory birds. The Proponent stated that these waters are already contaminated, and therefore any effects due to the addition of harmful substances into these basins would be limited. Further, Boat Harbour, the settling basins, and

[21] A qualified individual is someone who, through education, experience and knowledge relevant to a particular matter, provides the Proponent with advice within their area of expertise.

the aeration stabilization basin would then be remediated resulting in any potential effects also being short-term and reversible.

Environment and Climate Change Canada stated that wildlife response plans for any scenario that may impact migratory birds directly or indirectly, including exposure to harmful substances, should be developed. The wildlife response plan should include details about how effects from the deposit of harmful substances into surface water frequented by migratory birds (e.g., the temporary relocation of existing waste to the settling basins or aeration stabilization basin or the resuspension of contaminated sediments during dredging) will be monitored and mitigated. Measures to be implemented to help prevent migratory birds from using these waters, or in the event they are found, should be identified by the Proponent, including an evaluation of the efficacy of deterrents and hazing tools.

The Proponent predicted that, following the implementation of mitigation measures, residual effects to migratory birds and bird species at risk mortality risk due to increases in traffic, heavy machinery operation, and demolition activities, would not be significant.

Significance of Residual Effects

The Proponent predicted that the effects to migratory birds would be generally moderate in magnitude, short- to medium-term in duration, and partially reversible. Effects due to sensory disturbance due to the operation of streetlights were predicted to be long-term and irreversible, however the magnitude of these effects would be low. The Proponent predicted that potential residual effects to migratory birds, including migratory bird species at risk, would not be significant, given the mitigation, follow-up, and monitoring measures proposed, and given that residual effects are not expected to threaten the long-term persistence or viability of migratory birds and bird species at risk within the RSA.

5.2.2 IAAC Analysis and Conclusions

Analysis of the Effects

IAAC is of the view that the Proponent adequately characterized potential project effects for habitat loss, sensory disturbance, and changes in mortality risk to migratory birds and bird species at risk. IAAC acknowledges that the purpose of the Project is to remediate the SSA, a contaminated site, and understands that after the SSA is remediated and vegetation returns, the SSA is likely to provide improved habitat for migratory birds, including species at risk.

IAAC acknowledges that the Project will result in habitat losses or changes to habitat, including wetland habitat, that may adversely affect migratory birds and bird species at risk. Habitat loss would be restricted to the SSA. While the majority of habitat loss would be partially reversible following reclamation and revegetation, a small amount would be permanently lost. IAAC notes that the amount of loss will be confirmed as the remedial objectives for the Project are confirmed. IAAC is of the view that the development of a wetland compensation plan, as required by Nova Scotia Environment and Climate Chage and described in Section 5.1 (Fish and Fish Habitat) of this report, will offset wetland function loss that supports birds by restoring existing degraded wetlands on-site and/or creating new wetlands in a nearby area.

IAAC acknowledges that noise and light produced by the Project could deter birds from the SSA or alter their behavior. These sensory effects are expected to be temporary and localized. IAAC notes that the mitigation measures and monitoring requirements described in Section 5.3 (Health Conditions) of this report regarding noise will contribute to reducing the effects of sensory disturbance on migratory birds. Additionally, the Proponent will use best practices, such as the installation of downward facing or motion sensing lights where practical to reduce disturbance to birds.

IAAC recognizes that the Project may result in an increased risk of mortality to migratory birds and bird species at risk throughout all project phases. IAAC acknowledges that the Project may increase the likelihood of migratory birds being exposed to, or ingesting, contaminated water, which has potential to result in harm or mortality to migratory birds. The Proponent will be required to develop and implement measures to help prevent migratory birds from using of the SSA that are undergoing active remediation. An increase in traffic volume caused by the Project, as well as the use of heavy machinery, would result in increased mortality risk to birds due to collisions. The use of the SSA may increase traffic post-remediation, however the use of heavy machinery related to the Project will cease. The Proponent also committed to avoiding leaving large piles or patches of bare soil uncovered or un-vegetated during the nesting season, wherever possible, to discourage ground-nesting or burrow-nesting for species. The Proponent will be required to determine the presence or likely presence of any migratory bird nest that could be affected by a project activity, prior to commencing that activity. Under the direction of a qualified individual, appropriate set-back distances would be established around any identified nests in which project activities can not occur.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, IAAC is of the view that in the long term, the Project will result in an overall improvement to migratory birds, due to improvements to migratory bird habitat from the removal of contaminated sediments in the SSA. The magnitude of any adverse residual effects assessed above on migratory birds are considered to be low, and effects will be limited to the SSA. The duration of these effects would be short- to medium-term, and partially reversible.

Conclusions

IAAC is of the view that the Project is not likely to cause significant adverse effects on migratory birds, taking into account the implementation of the mitigation, follow-up, and monitoring measures proposed by the Proponent and the key mitigation measures described below.

Key Mitigation Measures and Monitoring to Avoid Significant Effects and Follow-Up Program Requirements for Migratory Birds

IAAC considers the following mitigation measures, monitoring, and follow-up programs to be necessary to ensure the Project is not likely to cause significant adverse effects to migratory birds. IAAC is of the view that these key mitigation measures would also mitigate effects to bird species at risk and are necessary for meeting IAAC's section 79 obligations under SARA. The following key mitigation measures are based on

mitigation measures,[22] monitoring, and follow-up programs proposed by the Proponent, expert advice from federal authorities, and comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia.

Key Mitigation Measures

- All activities associated with the Project will be executed in a manner that protects migratory birds and avoids capturing, taking, injuring, killing, or harassing migratory birds or destroying, taking, or disturbing their eggs, or damaging, destroying, removing or disturbing their nests, while taking into account Environment and Climate Change Canada's *Guidelines to Avoid Harm to Migratory Birds*.
- Prior to starting any project activity, determine the presence or likely presence of migratory bird nests protected under the *Migratory Birds Convention Act, 1994* and its regulations, and residences protected under SARA, that may be impacted by that activity. If nests or protected residences are identified, establish setback distances under the guidance of a qualified professional, within which project activities will not occur while the nests are protected.
- Lights used at nighttime within the SSA, during all phases of the Project, will be aimed downwards to mitigate adverse effects on migratory birds while meeting requirements for the health and safety of Project employees and contractors.
- Implement measures to mitigate adverse effects on migratory birds from project lighting, while meeting operation and safety requirements. As part of these measures, the Proponent will:
  - Use directional lighting that targets only areas where lighting is required;
  - optimize lighting design to reduce the total amount of lighting needed;
  - use shielded fixtures to reduce glare and light leakage in directions where light is not required; and
  - place light fixtures on poles or infrastructure at the lowest possible height.
- Prior to site preparation, and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Environment and Climate Change Canada, and any other relevant authorities, develop measures, including the use of deterrents to help prevent migratory birds from using dredged wetlands, settling basins, the aeration stabilization basin, the containment cell, and any other Project infrastructure where contact water may be stored or conveyed. These measures will be implemented prior to site preparation and continue until dam removal.
- During site preparation and remediation, cover stockpiles and patches of bare soil from mid-April to late August to discourage migratory birds from nesting in these areas.

Follow-up and Monitoring

IAAC considered the follow-up and monitoring plans proposed by the Proponent, advice from federal and provincial authorities, and comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia in identifying the following follow-up programs necessary to verify the predictions of the EA and the effectiveness of mitigation measures.

[22] For the purposes of its analysis with respect to mitigation measures and follow-up requirements in this report, IAAC has assumed that the arrangement by which PLFN leads on behalf of the Mi'kmaq of Nova Scotia will continue.

- Prior to the Project commencing, a follow-up program will be developed, in consultation with Environment and Climate Change Canada, and any other relevant authorities, to verify the accuracy of the EA and to determine the effectiveness of mitigation measures related to avoiding harm to migratory birds, their eggs and nests. The follow-up program will be implemented during all project phases.

Additional mitigation measures, monitoring, and follow-up programs applicable to project-related effects to migratory birds and bird species at risk can be found in the following sections of this report: Fish and Fish Habitat (Section 5.1), Health Conditions (Section 5.3), and Accidents and Malfunctions (Section 6.1).

5.3 PLFN and the Mi'kmaq of Nova Scotia – Health Conditions

The Project after applying mitigation measures, could cause residual adverse effects on the health conditions of PLFN and the Mi'kmaq of Nova Scotia, including mental health and well-being, through changes to the availability, quality, and access to country foods, air quality, acoustic environment, and groundwater quality.

IAAC is of the view that the Project is not likely to cause significant adverse effects on PLFN and the Mi'kmaq of Nova Scotia's health conditions after taking into account the proposed key mitigation measures. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, and the views expressed by federal and provincial authorities, and PLFN on behalf of the Mi'kmaq of Nova Scotia.

5.3.1 Proponent's Assessment and Views Expressed

The Proponent provided an assessment of effects on PLFN and the Mi'kmaq of Nova Scotia, with additional specific analyses of economic and social effects, archaeological/ cultural effects, and human health. IAAC's summaries below for the health conditions of PLFN and the Mi'kmaq of Nova Scotia utilize information from the Proponent's assessments, as well as the Human Health Ecological Risk Assessment (HHERA), Mi'kmaq Ecological Knowledge Study (MEKS) and PLFN Well-being Baseline Study, included as appendices to the EIS.

Description of the Existing Environment

Physical Health

Country Food

The SSA was traditionally used by the Mi'kmaq of Nova Scotia for fishing, hunting, and gathering, as discussed in Section 1 (Introduction), however, currently, country foods are generally not consumed. PLFN snared rabbits in the SSA in the early 1980s; this practice stopped after reports of lumps on the snared

rabbits, which were assumed to be related to the contamination within the SSA. Access to portions of the SSA is currently limited due to administrative controls such as fencing and signage.

Nearly half of the survey participants in the PLFN Well-being Baseline Study reported that they have run out of food for their family, and access to country foods would help with food insecurity. PLFN expressed its desire and expectation to be able to use the lands within the SSA for future food security purposes after the completion of the Project.

Air Quality

Ambient air quality has been monitored since 2018 and is expected to continue until remediation is complete. Sulphur-related odours resulting primarily from the operation of the pulp mill have been noted throughout Pictou County, including the SSA, however these odours have improved since the pulp mill ceased operations. In 2020, ambient air quality within the SSA met the federal and provincial standards and criteria[23] for gaseous contaminants and particulate matter. The Proponent identified speciated sulphur compounds as potentially exceeding applicable regulatory criteria because although speciated sulphur compounds were not detected, the laboratory detection limit was higher than the regulatory criteria

Acoustic Environment

A baseline sound pressure level monitoring program was conducted at sensitive receptor locations within the SSA and LSA, all of which were residential areas. The Proponent identified the main sensitive receptor as PLFN, with the primary sources of sound as wildlife, light vehicular traffic, and operational noise from the effluent treatment facility, specifically the aeration stabilization basin. Sound levels did not exceed the Nova Scotia Environment and Climate Change *Guidelines for Environmental Noise Measurement and Assessment*. Health Canada expressed concerns that the Proponent's baseline noise data included noise from the operation of the pulp mill and the effluent treatment facility and may not represent current noise levels, therefore underestimating the increase in noise from project activities. The Proponent stated that the pulp mill is 3.3 kilometres away from the effluent treatment facility and would not have significantly altered baseline noise levels. Health Canada also noted that the Proponent measured baseline noise levels at monitoring stations rather than at point of reception locations, which may not be representative of the baseline noise levels at receptors and could increase uncertainty in the Proponent's predictions.

Groundwater Quality

The Proponent assessed the baseline groundwater conditions at the SSA using data obtained from a groundwater monitoring well network located around the effluent treatment facility, the PLFN groundwater wellfield, and existing publicly available data. Most of the wells within the SSA sampled in 2017 and 2018 met Health Canada's *Guidelines for Canadian Drinking Water Quality* except for those directly adjacent to the aeration stabilization basin, which had exceedances of aluminum, arsenic, cobalt, lead, and/or chloride. Manganese concentrations also exceeded drinking water quality guidelines in several monitoring wells within the SSA, however, the Proponent stated that manganese in groundwater is considered to be

[23] Ambient air quality concentrations were compared to the maximum permissible ground level concentrations outlined in the *Nova Scotia Air Quality Regulations*. For parameters not included in these regulations, the Proponent used *Ontario Ambient Air Quality Criteria* and *Canadian Ambient Air Quality Standards*

naturally elevated in Nova Scotia. Manganese concentrations measured from peninsula and off-peninsula monitoring wells between 2007 and 2010 were consistent with the concentrations measured in the SSA.

Drinking water is not consumed from the SSA; PLFN currently obtains drinking water from a groundwater wellfield located over 500 metres east of the SSA, which is not hydraulically connected to the SSA groundwater.

Mental Health and Well-being

The Proponent described mental health conditions in the PLFN community and the psychological implications of the legacy of the containment cell. The PLFN Well-being Baseline Study carried out in 2019 was used to establish a baseline status of mental and social well-being of PLFN to support the identification of potential effects of the Project to PLFN. Participants in the PLFN Well-being Baseline Study spoke about the current conditions in the community:

> ***But what really affects me is the mental health...the pollution all around, it affects me. It affects my wellbeing, the way I feel…the fact that this was done to us, makes me mad. And it affects my emotional health and my mental health. And it feels like there's nothing I can do about it, you know…it's been there for so many years...would someone please get rid of it. That's what we're asking. We're begging people to get rid of [it] once and for all.***

> ***I don't know what life was like before Boat Harbour, but I do know that I often think about what life would be like… without it. It's hard to think about it. It's hard to think that we live[d] in a beautiful place because it's so disrupted… it's like it's just been a nightmare... Every night you go to bed, it's your nightmare, you wake up to it and that's how people feel.***

Prediction of Effects

Methodology for Determining Effects to Human Health

The Proponent conducted an HHERA[24] to assess the current potential health effects to humans and ecological receptors caused by exposure to contaminated soil, sediment, surface water, groundwater, and country food within the SSA. The findings of the HHERA were used to develop remedial objectives (site-specific target levels,[25] or SSTLs), mitigation measures, and follow-up monitoring programs. Using the findings of the HHERA to represent existing or baseline conditions, the Proponent also conducted a separate Human Health Risk Assessment (HHRA) to evaluate the potential human health risks associated with project-related activities (e.g., dust from trucks), including the assessment of ambient air quality contaminants such as particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), nitrogen oxides, and sulfur oxides.

Human Health and Ecological Risk Assessment

Although the use of the SSA is currently limited due to contamination, the HHERA was conducted assuming potential post-closure residential use on the land-based portions of the SSA and recreational land use (including collection and consumption of country foods) within land- and water-based portions of the SSA. The Proponent identified residents and recreational users who would potentially come into direct contact with contaminated sediment or consume country foods as the most sensitive receptors.

Samples collected from soil, groundwater, sediment, surface water, and country foods were compared to the appropriate pathway-specific human health and ecological-based screening guidelines established by applicable provincial jurisdiction (Nova Scotia) or regional framework (i.e., Atlantic Partnership in Risk-Based Correction Action Implementation for hydrocarbons), and CCME guidance to identify contaminants of potential concern (COPCs). For parameters without guidelines, data was screened against appropriate guidelines published by other Canadian agencies or by United States Environmental Protection Agency. The Proponent assessed which exposure pathways for human health were considered operable (i.e., to be included in exposure calculations) and concluded that, with respect to PLFN and the Mi'kmaq of Nova Scotia, contact with contaminated sediment and the consumption of some country foods would be utilized, while soil, groundwater, and surface water were not carried forward as exposure pathways as concentrations of COPCs were below screening guidelines or background concentrations. Additionally, the Proponent's HHRA identified the inhalation of road dust from project-related activities as an operable exposure pathway.

The Proponent determined that the current cancer risk for the PLFN resident/recreational user at both the freshwater wetlands and estuary is below Health Canada's target cancer risk. Non-carcinogenic health

[24] An HHERA estimates the nature and probability of adverse health effects to humans and ecological receptors who may be exposed to contaminants through different exposure routes (i.e., ingestion, inhalation, and dermal contact) in specific environmental media (i.e., sediment, soil, country foods, air, groundwater, and surface water).

[25] Site specific target levels are equivalent to site-specific remedial objectives (contaminant clean-up levels) Contaminant concentrations below these values are identified by the Proponent to be protective of human health.

risks were identified for PLFN residents and recreational users from direct contact exposure to dioxins/furans and vanadium in the sediments of the SSA.

Health Canada indicated there are several uncertainties with the Proponent's HHERA that could lead to an underestimation of the human health risk from project activities. Health Canada disagreed with some of the methodology and/or assumptions used in the HHERA, including the Proponent's rationale for considering certain exposure pathways inoperable, which is further discussed in the sections below.

Site-Specific Target Levels

Based on the results of the HHERA, and following Health Canada's *Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals,* the Proponent calculated SSTLs considered to be protective of a resident and recreational user exposed to vanadium and dioxins/furans from direct contact with sediment.

The Proponent used four exposure scenarios to calculate SSTLs and chose the lowest as the remedial objectives for the freshwater wetlands and estuary (including Boat Harbour and associated basins).[26] These SSTLs were used to predict which areas of the SSA require sediment to be removed, and which areas can be left in place to be risk-managed over time.

Health Canada expressed concerns about the results of the HHERA, which may result in the Proponent proposing remedial objectives that would not be fully protective of human health. Concerns included the methods in which certain exposure pathways were eliminated, the use of daily exposure limits which may not be appropriate for all future land-uses, and the use of unverified assumptions. Nova Scotia Environment and Climate Change expressed similar concerns with the methodology and noted that requirements of the *Nova Scotia Contaminated Sites Regulations* would be incorporated into the conditions for the amendment of the provincial approval for the existing containment cell.[27]

The Proponent noted that the proposed SSTLs are preliminary, and would be finalized during the provincial approval process pursuant to the Nova Scotia *Environment Act.* The Proponent stated that if the SSTLs were recalculated using Health Canada's recommendations, it would likely result in remedial objectives that are technically unachievable, and in this case, the Project would likely not proceed as proposed, and the SSA would continue to be risk-managed for the foreseeable future.

Health Canada recommended the Proponent conduct post-remediation monitoring and if monitoring indicates contamination levels exceed established target levels, the HHRA must be updated. The updated post-remediation HHRA, if required, would be used to identify any residual human health risks present for dioxins and furans, vanadium, and for any COPCs exceeding appropriate human health-based environmental quality criteria or background concentrations remaining after remediation is complete. The

[26] The exposure scenarios considered were: recreational use on intertidal flats of a sandy beach; recreational use on intertidal mudflats; reed gathering; and in-water recreational activities. SSTLs were based on the "intertidal mudflats scenario" which assumes toddler exposure to sediment, for seven days a week and four hours per day.

[27] An amendment to the provincial approval for the existing containment cell will be required to facilitate receipt and handling of stabilized or solidified contaminated waste. All remedial and industrial/operational components requiring approval will be consolidated into the existing provincial approval.

Proponent committed to the development and implementation of additional measures, such as additional remediation of discrete areas exceeding the remedial objectives and background concentrations (or "hot spots") or implementing administrative controls, such as restricting access to specific areas in the SSA, if post-remediation monitoring, or the updated HHRA indicates the potential for risks to human health.

PLFN expressed concerns about the potential for land-use restrictions within the SSA post-remediation, and stated that understood that land use restrictions were not being considered post-remediation.

Extent of Remediation

The Proponent used a risk management approach to evaluate hazards and exposure potential in the SSA. The Proponent estimated which areas of the freshwater wetlands and estuary would require ex-situ sediment remediation using exposure point concentrations to achieve the remedial objectives (i.e., the SSTLs) for dioxins and furans. Health Canada noted that there is uncertainty associated with using exposure point concentrations[28] to delineate the extent requiring ex-situ sediment remediation because SSTLs are statistical estimates, and removing impacted sediments to the target level is not precise.

Health Canada also noted that due to the approach used by the Proponent to determine which areas would be remediated, hot spot areas may remain in the SSA post-remediation, and contaminated sediment would enter the Northumberland Strait after the removal of the dam. The Proponent will be required under the Nova Scotia regulatory process to develop a sediment sampling procedure to be implemented during remediation activities. The procedure would be used throughout remediation to ensure residual contamination in the sediment is below remedial objectives prior to moving to a new area to remediate and would help determine the final extent of remediation required. The Proponent stated this sampling program would also include how "hot spot" areas would be identified and addressed. The Proponent is of the view that the implementation of this sediment sampling procedure during remediation would ensure there would be no post-remediation exceedances of the remedial objectives.

Effects to Physical Health

Country Foods

The Proponent's HHERA considered the consumption of country foods as an operable pathway for plants, game organs, and waterfowl, but consumption of terrestrial plants, fish from the wetlands, shellfish, terrestrial game meat and organs, and aquatic game meat were considered inoperable. Health Canada expressed concerns regarding the Proponent's assessment of country foods due to the methods used to screen out some pathways and COPCs related to country foods in the HHERA. Health Canada was also of the view that the Proponent did not adequately consider the potential of bioaccumulation or biomagnification of COPCs in the food web.

The Proponent stated that the remediation activities would reduce the concentrations of COPCs in the sediment within the SSA, therefore reducing concentrations of COPCs in aquatic country food post-closure. The Proponent acknowledged there are uncertainties about COPC concentrations in aquatic biota as a function of the type and life-cycle of species that may re-colonize the area post-closure and committed

[28] Exposure point concentrations are estimates of the average chemical concentration in an environmental medium in a defined area.

to post-closure monitoring of country foods. Health Canada recommended that the country food monitoring program reconsider any contaminants or pathways, including the consumption of shellfish, that were screened out using inadequate methods. Health Canada recommended that the monitoring be informed by PLFN and the Mi'kmaq of Nova Scotia, and include provisions to adapt monitoring to include new species that may colonize in the area post-closure. Health Canada recommended that post-closure monitoring be extended beyond the estuary to address uncertainty with potential human health risks from country foods associated with exposure to suspended sediment, including contaminated sediment released into the Northumberland Strait.

Air Quality

During all phases of the Project, vehicle exhaust and dust emissions from transportation and operation of heavy equipment could result in the release of air contaminants. Direct inhalation of contaminants or consumption of country foods affected by deposition of contaminants could cause adverse effects on the health of PLFN and the Mi'kmaq of Nova Scotia.

With the exception of total suspended particles, particulate matter less than 10 microns (PM_{10}), and iron, the Proponent predicted that COPCs concentrations at the SSA boundary and at residential receptors would be below applicable air quality criteria.[29] The Proponent stated that elevated concentrations of total suspended particles, PM_{10}, and iron related to truck traffic on the access road would be limited primarily to a forested area near the entrance to the SSA.

The Project would potentially result in odours from disruption and dewatering of organic and nitrogen-bearing material, and due to the release of hydrogen sulfide from contaminated sediment. The hydrogen sulfide exceedance modeled at the SSA boundary was located in an uninhabited area directly downwind from the containment cell and was caused by the relocation of existing waste from the containment cell and dewatering of dredged sediment. These impacts were predicted by the Proponent to be temporary and short-term. The Proponent committed to implementing a protocol for receiving and addressing complaints for project-related effects, including odour, during all phases of the Project. In the long-term, the Proponent stated that the Project would result in a positive impact due to the anticipated reduction of odours due to the closure of the settling basins and filling of the effluent ditches.

Health Canada noted that the Proponent's air quality modeling did not account for trucks used for hauling waste to the containment cell. The Proponent stated that this was not included because only small quantities of waste would be transported this way, and this activity would occur infrequently. To reduce vehicle emissions, the Proponent stated that fuel-efficient vehicles would be used, and a policy would be implemented to limit idling of equipment and vehicles.

The Proponent committed to monitoring air quality, including dust during all phases of the Project. The monitoring program would include action levels and associated mitigations for monitored air contaminants, with mitigations including additional watering of roads and reduced volume or speed of traffic. Health Canada recommended that the Proponent provide a description of additional mitigation measures that will be applied should the monitored levels of total suspended particles, PM_{10}, $PM_{2.5}$, diesel particulate matter, volatile organic compounds, polycyclic aromatic hydrocarbons, or reduced sulfur compounds exceed the

[29] Ambient air quality impacts were assessed by the Proponent using three criteria: Nova Scotia Ambient Air Quality Criteria, Canadian Ambient Air Quality Standards, and Ontario Ambient Air Quality Criteria.

predicted levels. PLFN and Health Canada expressed the importance for air quality monitoring to continue post-closure due to the release of landfill gas from the containment cell. The Proponent confirmed that landfill gas monitoring would be conducted as part of the post-closure care of the containment cell, and the monitoring program would be submitted to Nova Scotia Environment and Climate Change to support the amendment of the provincial approval for the existing containment cell.

The Proponent determined that the Project would result in a temporary degradation of air quality within the SSA. The Proponent stated this effect would be moderate in magnitude, short-term, and reversible. The Proponent concluded that the potential effects from air quality and odour to the health of PLFN and the Mi'kmaq of Nova Scotia would be negligible. The Proponent added that the Project after completion of remediation would potentially result in improved air quality.

Acoustic Environment

Increases in noise from project-related traffic, including heavy machinery, would occur during all phases of the Project. The Proponent specified that all construction and demolition activities, as well as associated trucking activities, would be conducted between 7:00am – 11:00pm, except dredging which would occur continuously.

The Proponent stated that noise levels at sensitive receptors would be minimized due to attenuation, vertical separation, and by using best practices for the construction and demolition activities. Project equipment would meet industry standards with respect to noise level thresholds. A complaints protocol would be implemented to receive and address noise concerns from PLFN and nearby residents.

The Proponent stated that the effects on sensitive receptors from noise caused by the Project are anticipated to be low in magnitude, Additionally, any construction or operational noise would be below Nova Scotia Environment and Climate Change's *Guidelines for Environmental Noise Measurement and Assessment* at the worst-case receptor locations. Disturbance due to noise would be confined to the LSA, and be short- to medium-term duration, and reversible. The Proponent stated that after the implementation of mitigation measures the effects would not be considered significant.

Health Canada noted gaps in the quantitative noise assessment that may have underestimated noise impacts, particularly at night and near sensitive locations like hospitals and schools. Health Canada recommended that the Proponent develop additional measures to mitigate nighttime noise, especially in areas where activities like dredging might disrupt sleep.

Groundwater

The Proponent stated that the site currently does not contain potable wells and potable water for PLFN is supplied from their wellfield which is located east of the SSA and is not influenced by the SSA. Therefore, groundwater was not carried forward as an exposure pathway in the HHERA.

Health Canada, Nova Scotia Environment and Climate Change, and PLFN did not agree with the Proponent's rationale to exclude potable groundwater as an exposure pathway based on its lack of current use. The provincial approval process would require the Proponent to adhere to the intent of the *Nova Scotia Contaminated Sites Regulations* and the SSA would be considered potable as it is not serviced by municipal water. There may be a requirement to implement a potable water exclusion zone which would restrict future installation of potable wells near the aeration stabilization basin and containment cell. PLFN

noted that the implementation of a potable water exclusion zone could have negative implications to PLFN, should PLFN have the desire to expand. PLFN also expressed concern about how the containment cell could negatively affect the current groundwater supply. The Proponent stated there are no indications that leachate originating from the containment cell has impacted groundwater quality, but in the event the groundwater table raises above the base of the containment cell, which would be 2.5 to three metres above the groundwater table, groundwater would enter the containment cell and be collected by the leachate collection system.

Nova Scotia Environment and Climate Change stated that based on the Proponent's information, the PLFN groundwater supply is not in a fully confined aquifer zone due to fracture flow and should be considered semi-confined or "leaky". Nova Scotia Environment and Climate Change stressed that this does not necessarily mean the PLFN wellfield is under increased risk of impact from the planned remediation activities, and this uncertainty can be addressed through the development of a robust, long-term groundwater monitoring program. The Proponent committed to monitoring groundwater quality and quantity during all phases of the Project, including post-closure.

PLFN expressed concerns about access to potable water during the causeway removal and bridge construction. The Proponent stated that a temporary water main would be constructed to maintain access. The Proponent committed to consult with PLFN on behalf of the Mi'kmaq of Nova Scotia about the timing of temporary interruptions to potable water access when the temporary water main is installed, noting that these interruptions could be scheduled to occur overnight or during a lower-use time.

The Proponent concluded that all exposure pathways examined would result in negligible to low risk to physical health to PLFN and the Mi'kmaq of Nova Scotia as a result of the Project and determined that the residual effects of the Project on physical health would be of low magnitude and not significant. The Proponent also stated the Project would result in positive residual environmental effects to physical health, as the Project would result in air quality improvements and the containment of contaminated sediment.

Effects to Mental Health and Well-being

The Proponent acknowledged the concerns of PLFN regarding the impacts to well-being from the containment cell's location in the SSA and the psychological implications of the legacy and stated this will be part of its issues tracking through the course of remediation and post-closure. The Proponent stated there would be an adverse residual effect to the well-being of PLFN due to the continued storage of waste in proximity to the community and reasoned that it would not be significant in comparison to conditions under an operational effluent treatment facility. The Proponent acknowledged this was not consistent with the determination presented in the PLFN Well-being Baseline Study.

PLFN state the indefinite use of the vertically-expanded containment cell will prolong the historic trauma associated with Boat Harbour to the health, socioeconomic, and cultural detriment of PLFN. The following excerpt from the Final Position of PLFN on Proposed Boat Harbour Remediation Project further describes the trauma experienced by the community:

> ***The decision as to where the toxic waste to be dredged from Boat Harbour will be stored indefinitely, must take into account the historic trauma suffered by***

Pictou Landing First Nation. In addition to the historic trauma common to many Indigenous Peoples of Canada arising from the taking of traditional lands, violence, disease and government policies aimed at destroying Indigenous culture, including most notability, the Indian Residential School system and the Indian Act, the imposition of the Boat Harbour treatment facility was a unique source of trauma to PLFN.

The indifference of both the provincial and federal levels of government to the adverse impacts of the Boat Harbour treatment facility on the community both continued and exacerbated the trauma experienced by PLFN. The long history of broken promises around the closure and cleanup of the Boat Harbour treatment facility speaks to this.

The result has been worse individual health, including mental health, outcomes within PLFN and an overall feeling of hopelessness and malaise where cynicism and distrust for government abound. This has affected PLFN's economic prospects.

The decision to exclude the Boat Harbour Landfill from the scope of the Boat Harbour cleanup and to instead increase its size and use it indefinitely to store 10 times the current volume of toxic waste, will simply perpetuate the historic trauma associated with the Boat Harbour treatment facility. The socioeconomic and cultural effects of the historic trauma will continue.

Significance of Residual Effects

The Proponent predicted that residual effects to the health of PLFN and the Mi'kmaq of Nova Scotia would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Residual effects to PLFN and the Mi'kmaq of Nova Scotia's health conditions would occur within the LSA, be short- to medium-term in duration, and reversible.

5.3.2 IAAC Analysis and Conclusion

Analysis of the Effects

Physical Health

The purpose of the Project is to remediate the SSA, a contaminated site, and IAAC is of the view that after the remediation is complete, existing risks to human health will be reduced.

IAAC agrees with the uncertainty expressed by Health Canada, Nova Scotia Environment and Climate Change, and PLFN about the proposed remedial objectives (i.e., SSTLs) which may not be fully protective of human health. However, IAAC acknowledges that the remedial objectives presented by the Proponent are considered preliminary and have not yet been finalized. Based on information from Nova Scotia Environment and Climate Change, it is IAAC's understanding that Nova Scotia's Ministerial Protocol Framework, which prescribes the minimum requirements to assess and remediation contaminated sites in Nova Scotia, are applicable to the Project and will be incorporated into the provincial regulatory approval process. As part of this provincial process, Nova Scotia Environment and Climate Change may invite relevant federal authorities, such as Health Canada, to provide expert input, and this process will be used to finalize the remediation approach, including remedial objectives. IAAC acknowledges the provincial process may not require the Proponent to change the remedial objectives, as the Proponent stated that any remedial objectives lower than those calculated by the Proponent may not be technically achievable. IAAC is of the view that remediating the SSA to the SSTLs proposed by the Proponent will likely reduce, but may not eliminate, the existing risks to the physical health of PLFN and the Mi'kmaq of Nova Scotia. IAAC is of the view that if the SSTLs proposed by the Proponent are used as remedial objectives for the Project, there is a greater potential for post-remediation contamination levels to exceed levels fully protective of human health, in comparison to using remedial objectives that consider all operable exposure pathways, COPCs, and accurate site exposure assumptions.

IAAC acknowledges that due to the nature of the Project, residual contamination will be present in the wetlands post-remediation, regardless of the remedial objectives used. IAAC acknowledges that the Proponent is of the view that the implementation of a sediment sampling procedure during remediation activities would ensure exceedances of the remedial objectives would not be present post-remediation, but IAAC notes that it is still uncertain whether the remedial objectives used during remediation would be considered fully protective of human health. IAAC is of the view that potential effects to human health resulting from residual contamination will be identified and addressed in follow-up monitoring conducted in the post-closure phase. Based on the results of follow-up monitoring, the Proponent may be required to update the HHRA to assess the residual post-remediation risks to the health of PLFN and the Mi'kmaq of Nova Scotia. If unacceptable human health risks are identified after remediation has occurred, measures will be implemented to reduce this risk. Measures could include administrative controls such as restricting access to portions of the SSA, or country food bans.

IAAC recognizes that the remedial objectives used for the Project will influence the amount of contamination remaining in the SSA, and the need for administrative controls after remediation. IAAC is of the view that remedial objectives should aim to eliminate, or minimize to the extent possible, the potential need for post-remediation administrative controls for the protection of human health. IAAC recognizes that

the remedial objectives for the Project will be determined by Nova Scotia Environment and Climate Change during the provincial approval process. In response to PLFN's concern about potential land-use restrictions in the SSA after remediation, the Proponent will be required to reevaluate the HHRA prior to site preparation, in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Health Canada, and Nova Scotia Environment and Climate Change. The Proponent will be required to reevaluate whether the appropriate COPCs, relevant toxicological reference values, potential human receptors, and operable exposure pathways were used in the HHRA. Follow-up monitoring of country foods, sediment, soil, air, and drinking water will begin prior to site preparation, and results of this monitoring will be used to verify whether current conditions (i.e., concentrations and spatial distribution of COPCs) in the SSA are still adequately reflected in the HHRA. If the results of the verification indicate that any parameters were not adequately incorporated, the Proponent will modify the HHRA. The modified HHRA, if required, will be used to recalculate the remedial objectives, both of which will be submitted to Nova Scotia Environment and Climate Change to inform the provincial approval process and the finalization of the remedial objectives for the Project.

IAAC is of the view that potential adverse effects to health may occur post-closure via the consumption of country foods. The Proponent will be required to develop a country food monitoring program, in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and Health Canada, that will include the collection of additional baseline data. The Proponent will be required to develop provisions to adapt the monitoring to include any new country food species that may occur and be consumed, or intended to be consumed, by PLFN and the Mi'kmaq of Nova Scotia in the future. If the monitoring program detects it is unsafe to consume country foods from the area, the Proponent will be required to implement administrative controls, such as restricting the consumption of country foods until monitoring results confirm safe levels have been reached.

IAAC is of the opinion that although the air quality modeling may not accurately reflect Project emissions, these uncertainties can be addressed by monitoring. The Proponent will be required to monitor air quality, including dust, prior to site preparation and during all phases of the Project, and must develop mitigation measures that will be applied if the monitored levels exceed the established targets during the Project. Landfill gas monitoring will continue post-closure as part of the post-closure care of the vertically-expanded containment cell.

IAAC agrees with Health Canada's and Nova Scotia Environment and Climate Change's view that the potable groundwater exposure pathway should not have been deemed inoperable in the HHERA. According to the provincial *Contaminated Sites Regulations* and Ministerial Protocol framework the SSA, groundwater in the SSA is considered potable as it is not a municipally-serviced site. IAAC acknowledges that groundwater is not currently consumed from the SSA, however PLFN expressed that if a potable water exclusion zone is required in the areas near the aeration stabilization basin and vertically-expanded containment cell, this could have implications should the community wish to expand in the future. Drinking water monitoring during all phases, including post-closure will help ensure the project activities, including the long-term operation of the vertically-expanded containment cell, do not negatively impact the PLFN wellfield. The Proponent will be required to develop the drinking water monitoring program in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Nova Scotia Environment and Climate Change, and Environment and Climate Change Canada. Given the monitoring requirements and mitigation measures

proposed by the Proponent, IAAC agrees with the Proponent that potable water is unlikely to be adversely affected by the Project.

In addition to the specific requirements around monitoring discussed above, IAAC requires that the Proponent consult with PLFN on behalf of the Mi'kmaq of Nova Scotia and Health Canada on the design of monitoring plans that relate to human health, including sampling locations for air, soil, sediment, drinking water, surface water, and country foods that reflect community use. Through consultation, a plan for communicating results of the follow-up program will also be formulated.

IAAC shares Health Canada's and Nova Scotia Environment and Climate Change's views that there is uncertainty with the Proponent's assessment of the effect of the Project on the acoustic environment due to the methodology used to collect baseline noise data. IAAC acknowledges that the Proponent has committed to monitoring noise during the implementation of the Project and is of the view that potential impacts to PLFN and the Mi'kmaq of Nova Scotia can be addressed by the implementation of a complaints protocol, which will allow PLFN and nearby residents to report any concerns, specifically regarding odour or noise levels, so the Proponent can address these issues in a timely manner.

IAAC agrees with the Proponent that the potential residual effects to PLFN and the Mi'kmaq of Nova Scotia's physical health from the project activities are generally low in magnitude and will occur primarily within the SSA and LSA. Although the Project is expected to result in reduced contamination in the SSA, there is uncertainty about whether the contamination left in the SSA after remediation activities will be at levels considered fully protective of human health.

Given the definitions of the environmental effects rating criteria in Appendix A, the magnitude of residual effects assessed above on the physical health of PLFN and the Mi'kmaq of Nova Scotia is considered to be low, and effects will be limited to the LSA. The duration of these effects would be short to medium-term and reversible. IAAC is of the view that potential effects of the Project, as well as any uncertainties in the Proponent's assessment, can be addressed by the mitigation measures and monitoring and follow-up measures proposed by the Proponent and the key mitigation measures described below.

Mental Health and Well-being

IAAC acknowledges PLFN's view that the indefinite physical presence and continued use of the vertically-expanded containment cell will prolong the historic trauma associated with Boat Harbour to the health, socioeconomic, and cultural detriment of PLFN. IAAC is of the view that an increase in actual or perceived health risks related to the storage of hazardous waste adjacent to their community will also prolong or potentially heighten the anxiety felt by PLFN. The effects to the mental health and well-being of the PLFN community and its members from the presence of a vertically-expanded containment cell containing hazardous waste within the SSA are closely related to the effects to cultural heritage and the current use of lands and resources for traditional purposes. Refer to Section 5.4 (Physical and Cultural Heritage) and Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) for IAAC's analysis, including proposed mitigation measures to minimize the likelihood of the vertically-expanded containment cell remaining in the SSA permanently.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, the magnitude of residual effects assessed on the mental health and well-being of PLFN and

the Mi'kmaq of Nova Scotia is considered to be high, limited to the LSA, with a long-term duration, and reversible.

Conclusions

IAAC is of the view that the Project is not likely to cause significant adverse effects on the health conditions of PLFN and the Mi'kmaq of Nova Scotia, taking into account the implementation of the mitigation, follow-up, and monitoring measures proposed by the Proponent and the key mitigation measures described below.

Key Mitigation Measures and Monitoring and Follow-Up Program Requirements for the Health Conditions of PLFN and the Mi'kmaq of Nova Scotia

IAAC considers the following mitigation measures, monitoring, and follow-up programs to be necessary to ensure the Project is not likely to cause significant adverse effects to the health conditions of PLFN and the Mi'kmaq of Nova Scotia. The following key mitigation measures[30] are based on mitigation measures, monitoring, and follow-up programs proposed by the Proponent, expert advice from federal and provincial authorities, and comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia.

Key Mitigation Measures

- Develop measures to mitigate fugitive dust and particulate emissions within the SSA to be implemented from site preparation and continuing through closure, including the following:
  - apply water, or any alternative dust suppressant determined in consultation with Health Canada and Nova Scotia Environment and Climate Change, on access roads within the SSA during periods when dust generation is expected or occurring, including periods of drought and high winds;
  - cover all soil and aggregate material stored in stockpiles, or being transported within the SSA to reduce emissions of particulate matter from wind exposure;
  - develop and implement policies to reduce the fuel consumption of equipment and vehicles operating in the SSA, including a no-idling policy, taking into account Environment and Climate Change Canada's *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities*;
  - establish speed limits on all roads located in the SSA taking into account the recommended speed limits in Environment and Climate Change Canada's *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities*, and post speed limits along Project roads and require all persons to abide by them;
  - ensure all equipment and vehicles used within the SSA are serviced and maintained in accordance with the manufacturer's maintenance guidelines to support meeting emission standards.
- Prior to the Project commencing and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and relevant authorities, implement during all phases of the Project, a protocol for receiving and addressing complaints related to exposure to noise and odours generated by the Project.

[30] For the purposes of its analysis with respect to mitigation measures and follow-up requirements in this report, IAAC has assumed that the arrangement by which PLFN leads on behalf of the Mi'kmaq of Nova Scotia will continue.

Provide the protocol to IAAC prior to the Project commencing, and make the protocol publicly available online. The protocol should be designed to:

- describe how complaints can be provided and how it would be recorded and addressed, including developing an approach for ranking and responding to complaints received according to the anticipated level of noise or odour impacts; and
- identify, and implement as soon as technically feasible, mitigation measures and/or follow-up requirements in response to the complaints received.

- Prior to site preparation, in consultation with Health Canada, Nova Scotia Environment and Climate Change, and any other relevant authorities, reevaluate the Human Health Risk Assessment taking into account Health Canada's *Guidance for Evaluating Human Health Effects in Impact Assessment: Human Health Risk Assessment*. The Proponent must:
  - verify, in consultation with PLFN and the Mi'kmaq of Nova Scotia, Environment and Climate Change Canada, and any other relevant authorities, that relevant COPCs, relevant toxicological reference values, potential human receptors, and operable exposure pathways have been incorporated into the HHRA;
  - based on results of monitoring conducted prior to site preparation, identify any changes in site conditions, including concentrations and spatial distribution of COPCs, and determine whether these changes should be incorporated into the HHRA;
  - if the results of the verification indicate that any parameters were not incorporated, modify the HHRA and recalculate the remedial objectives (i.e., SSTLs). Remedial objectives should aim to reduce or eliminate the need for post-remediation administrative controls, including land-use restrictions for the protection of human health;
  - submit the modified HHRA and recalculated remedial objectives to PLFN on behalf of the Mi'kmaq of Nova Scotia, IAAC, and Nova Scotia Environment and Climate Change.

Follow-up and Monitoring

IAAC considered the follow-up plans and monitoring proposed by the Proponent, advice from federal and provincial authorities, and comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia in identifying the following follow-up programs necessary to verify the predictions of the EA and the effectiveness of mitigation measures:

- Develop, in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Health Canada, and any other relevant authorities, a follow-up program to verify the accuracy of the EA and determine the effectiveness of the mitigation measures as it pertains to effects from the Project on the health of PLFN and the Mi'kmaq of Nova Scotia caused by changes in COPC concentrations in country foods, including vegetation, wildlife, and fish (including shellfish). As part of the follow-up program, the Proponent must:
  - in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, identify, prior to site preparation and update during post closure, country foods that are consumed or intended to be consumed (including which tissues of those species would be consumed), within areas where Project-related contamination of these country foods may occur, and the locations within and

adjacent to the SSA where these country foods should be monitored. If new or additional country foods are identified post-closure, include these country foods in future monitoring;

- prior to site preparation, identify COPCs to be monitored in country foods, and COPC target levels. Monitor country foods prior to site preparation and during post-closure at the locations identified; and
- if monitoring results indicate COPCs exceed target levels during post-closure, update the HHRA and modify or implement additional mitigation measures.

- Develop, in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Health Canada, and any other relevant authorities, a follow-up program to verify the accuracy of the EA and determine the effectiveness of the mitigation measures as it pertains to effects from the Project on the health of PLFN and the Mi'kmaq of Nova Scotia caused by changes in COPC concentrations in sediment, soil, air, surface water, and drinking water. As part of the follow-up program, the Proponent must:
  - identify COPCs and monitoring locations to be monitored for sediment, soil, air, surface water, and drinking water;
  - monitor sediment, soil, drinking water, and air prior to site preparation;
  - continue monitoring air and drinking water during all phases of the Project, including post-closure;
  - monitor sediment, soil, and surface water during post-closure;
  - if monitoring results indicate COPCs exceed target levels for sediment, soil, air, surface water, or drinking water during post-closure, update the HHRA and modify or implement additional mitigation measures.

Additional mitigation measures, monitoring, and follow-up programs applicable to project-related effects to the health of PLFN and the Mi'kmaq of Nova Scotia can be found in the following sections of this report: Fish and Fish Habitat (Section 5.1), Migratory Birds (Section 5.2), Physical and Cultural Heritage (Section 5.4), and Current Use of Lands and Resources for Traditional Purposes (Section 5.5).

5.4 PLFN and the Mi'kmaq of Nova Scotia – Physical or Cultural Heritage, and Sites of Significance

The Project after applying mitigation measures, could cause residual adverse effects on physical and cultural heritage; and any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance (sites of significance), through changes in the terrestrial environment.

IAAC is of the view that the Project is not likely to result in significant adverse effects on physical and cultural heritage and sites of significance, after taking into account the proposed key mitigation measures, monitoring, and follow-up programs. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, and the views expressed by federal authorities and PLFN on behalf of the Mi'kmaq of Nova Scotia.

5.4.1 Proponent's Assessment and Views Expressed

The Proponent provided an assessment of effects on the Mi'kmaq of Nova Scotia, with additional specific analyses of economic and social effects, archaeological/ cultural effects, and human health. IAAC's summaries below for current use utilize information from the Proponent's assessments, as well as the MEKS and PLFN Well-being Baseline Study, both included as appendices to the EIS.

Description of the Existing Environment

Archaeological Resources

The majority of the SSA was identified as having elevated archaeological potential as shown in Figure 9. Four archaeological sites were also identified within the SSA. Three of these sites were determined to be post-contact sites with evidence of historic farms and associated cultural resources. One pre-contact site, A'se'k 1 Site, was identified after the recovery of stone flakes, which were considered by-products of stone tool manufacturing. Additionally, a PLFN elder informed the Proponent that arrowheads have been found on an island located near the aeration stabilization basin within the SSA.

Crown grant mapping and other historical documents identified burial grounds (known as the "Indian Burying Grounds") located at Indian Cross Point, within the LSA. The Proponent conducted archaeological reconnaissance and ground penetrating radar surveys to identify whether the burial grounds extend to the SSA within the pipeline corridor.[31] The exact location of the burial grounds could not be identified; however, results of this survey showed sub-surface anomalies that were consistent in size and depth, which suggests that burials could be present at Indian Cross Point, shown in Figure 9.

[31] Pipeline removal activities proposed for the Project have already been completed, as discussed in Section 2.3 (Project Components and Activities) of this report. No adverse environmental effects, or effects to archaeological resources, were identified due to pipeline removal activities. No further ground disturbance work within the pipeline corridor is proposed for the Project.

Figure 9: Archaeological Potential in the SSA

Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.1-50.

Figure Description: The majority of the SSA has moderate to high archaeological potential. Four archaeological sites, the James & Christina Sproull site, Donald McArthur site, Peter McArthur site, and the A'se'k 1 site are identified on the figure.

Cultural Heritage and A'se'k

The Proponent noted that the PLFN Well-being Study reports a significant experience of loss in terms of cultural heritage and cultural practices, related to the establishment and operation of the effluent treatment facility and subsequent contamination of the physical environment. The Proponent noted the interconnectedness of cultural practices with the natural environment and the loss of this relationship has resulted in a disruption to the practices and to the passing along of this knowledge between generations. This represents a significant loss and impediment to cultural identity and overall well-being. Cultural continuity through practice is of great importance to the Mi'kmaq of Nova Scotia – and continued practice is essential to the connection of that continued practice for their cultural survival.

The following quotes from the PLFN Well-being Study describe how PLFN members, including elders and youth, feel about the current loss of A'se'k.

Everybody looked at us as if we were poor, but I never considered myself that way. When I went outside, everything was there…But when they took A'se'k, that's when I started to look at myself as if I had nothing.

When you talk about the harm and our traditional Mi'kmaw ways…[w]e don't even know what it is. Because we haven't been able to practice it. So, that's the most harmful part of when I look at that question about your ceremonies and traditional Mi'kmaw spirituality, our generation doesn't know what it looks like. Because we haven't been able to practice it all these years.

Prediction of Effects

Archaeological Resources

The Project could affect the Mi'kmaq of Nova Scotia's physical and cultural heritage and sites of significance through direct disturbance or destruction caused by project activities involving ground disturbance, including dredging and demolition activities. These effects would be limited to the SSA.

The Proponent stated that most of the SSA has moderate to high archaeological potential, and all project personnel would be made aware of these areas and be given training to identify cultural heritage resources and sites of significance. The Mi'kmaq of Nova Scotia would be offered the opportunity to monitor any ground disturbance work in areas of high archaeological potential. The Proponent also committed to complete background research, shovel testing and/or test excavation for ground disturbances within 50 metres of the four identified archaeological sites.

If human remains or archaeological deposits are discovered, all project activities involving ground disturbance would be halted, and the Nova Scotia Department of Communities, Culture and Heritage would be contacted. A no-work buffer would be established around the discovery, and work would not resume until approval is received from the Nova Scotia Department of Communities, Culture and Heritage. Additionally, if human remains are discovered, the Assembly of Nova Scotia Mi'kmaq Chiefs, via the Kwilmu'kw Maw-klusuaqn Negotiation Office, would be contacted immediately.

Cultural Heritage and A'se'k

The Proponent stated that the Project would result in positive changes to the ecosystem which may, for example, create opportunities for traditional food fisheries to return to PLFN for community members wishing to harvest returning and new species for personal and ceremonial use. The Proponent stated that with the Project there would be the potential to return the water and land to a state that would encourage cultural, recreational, agricultural, and ceremonial use of the area.

The Proponent stated that the most significant concern raised by PLFN related to the use of the containment cell. Objections were raised with respect to the storage of waste in the SSA, as the presence of the vertically-expanded containment cell would not allow A'se'k and the community to fully heal spiritually and psychologically.

PLFN provided the following comment on an open house comment form received by the Proponent:

> ***A'se'k being turned into a treatment facility is environmental racism. Having a containment cell is not returning it to its original state. This isn't reconciliation. Take the contaminants somewhere else. To Quebec, anywhere. We don't want it. We also don't want to hear about how the containment cell is 'an economic opportunity' for jobs over the next 25 years. We don't care or want it. I want remediation but tired of PLFN constantly trying to explain ourselves, how we feel about this. Leaving the waste here isn't right, even if we can't see it. This affects us mentally, emotionally, physically. "We cannot heal in an environment that made us sick"***

The PLFN Well-being Baseline Study stated the following:

> ***Participants were asked if they trust that the remediation can bring A'se'k back to its' original state, less than one-quarter think so. Coming from the focus groups, residents want the province to stop using the phrase "getting it back to its original state". One lady said in frustration, "it's never going to be back to its original state. Especially with the containment cell".***

Significance of Residual Effects

The Proponent predicted that the potential residual environmental effect to the Mi'kmaq of Nova Scotia's physical and cultural heritage and sites of significance would not be significant, given the mitigation, follow-up, and monitoring measures proposed.

5.4.2 IAAC Analysis and Conclusions

Analysis of the Effects

Archaeological Resources

IAAC is of the view that the Proponent adequately characterized potential residual project effects to the physical and cultural heritage and sites of significance of PLFN and the Mi'kmaq of Nova Scotia. IAAC recognizes that the archaeological potential for most areas within the SSA is moderate to high, and although not expected within the SSA, there is potential for unmarked burials to be revealed during the Project. Therefore, project activities involving ground disturbance could result in the loss or alteration of physical and cultural heritage resources or sites of significance.

IAAC further understands that the Proponent will provide opportunities to PLFN on behalf of the Mi'kmaq of Nova Scotia to monitor any activities involving ground disturbance in areas of high archaeological potential and will consult with them if physical or cultural heritage resources or sites of significance are identified. IAAC acknowledges that the Proponent committed to ensuring all personnel conducting project activities that involve ground disturbance would be trained to identify physical and cultural heritage resources and sites of significance. If discovered within the SSA, the Proponent will follow appropriate steps, which will include halting work, implementing engagement and notification protocols, and delineating a no-work buffer around the discovery.

IAAC highlights the importance of continued engagement with PLFN on behalf of the Mi'kmaq of Nova Scotia regarding physical and cultural heritage and sites of significance. Given the permanence of potential effects, IAAC is of the view that PLFN should have the opportunity to be present during any project activities with the potential to result in the discovery of previously unidentified physical and cultural heritage resources or sites of significance. The Proponent is required to identify these opportunities in consultation with PLFN prior to the Project commencing.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, the likelihood of residual effects assessed above on archaeological resources are considered to be low. The magnitude of any adverse residual effects are assessed as low, limited to the SSA, and irreversible.

Cultural Heritage and A'se'k

IAAC acknowledges that the spiritual and cultural practices of Indigenous groups are often integrally linked to specific locations and surrounding landscape features. A'se'k was a gathering place traditionally used by PLFN and the Mi'kmaq of Nova Scotia for cultural and spiritual practices and for the transfer of Mi'kmaw knowledge and teaching of Mi'kmaw traditions to younger generations. As a result of the construction and operation of the effluent treatment facility, PLFN and the Mi'kmaq of Nova Scotia no longer felt a spiritual connection to A'se'k.

IAAC is of the view that the Project will result in the remediation of lands in the SSA, making the lands and resources (with the exception of the area of the vertically-expanded containment cell) physically accessable for cultural practice. However, IAAC recognizes that the Project would result in the loss of access to the land occupied by and immediately surrounding the vertically-expanded containment cell, which would prevent PLFN and the Mi'kmaq of Nova Scotia from engaging in spiritual and cultural activities in this area as long as the vertically-expanded containment cell is present in the SSA.

Additionally, as discussed in Section 5.5 of this report (Current Use of Lands and Resources for Traditional Purposes), PLFN stated that the presence, and vertical expansion of the containment cell by up to 24 metres, would have a negative effect on the quality of experience within the SSA, likely preventing them from using the SSA for traditional purposes. Similarly, this would also prevent the desire to restore cultural and spiritual activities in A'se'k, which would continue to limit their ability to heal and share knowledge with younger generations.

IAAC recognizes that, as stated in the PLFN Well-being Baseline Study, over two thirds of respondents reported that they look forward to having A'se'k return to how it once was; however, less than one-quarter believe that the Project can accomplish this. IAAC acknowledges that PLFN and the Mi'kmaq of Nova Scotia mistrust the government due to past promises that the operation of the effluent treatment facility and containment cell would not impact A'se'k. IAAC understands PLFN's desire for the area to be remediated and returned to its original state, but that the Project may not accomplish this if the vertically-expanded containment cell is permanent. PLFN's views about the permanent nature of the vertically-expanded containment cell in the SSA are also discussed in Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report.

To minimize the likelihood of the vertically-expanded containment cell remaining in the SSA permanently, the Proponent will be required to ensure it is reconstructed in a manner such that the waste can be removed, and the containment cell can be decommissioned. An advisory committee co-led by the Proponent and PLFN will be established for the purpose of identifying potential alternative locations for the long-term storage of the waste. Alternative locations will be assessed for technical and economic feasibility. If a suitable alternative location for the waste is identified, the Proponent will be required submit changes to the Project to IAAC, including the decommissioning of the vertically-expanded containment cell and moving the waste to an alternative location. The Proponent will be required to carry out these activities subject to any regulatory approvals, permits, or appropriations. The committee will continue its work for 10 years, or until the Proponent and PLFN agree to end the committee. Requests from PLFN to re-establish the committee after it has been terminated will be considered by the Proponent.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, the residual effects assessed above on the cultural heritage of the Mi'kmaq of Nova Scotia and PLFN is considered to be high magnitude, of long-term duration continuous frequency, and reversible.

Conclusions

IAAC is of the view that the Project is not likely to cause significant adverse environmental effects to the cultural heritage of PLFN and the Mi'kmaq of Nova Scotia after taking into account the implementation of the key mitigation measures identified below.

Key Mitigation Measures and Monitoring for Physical and Cultural Heritage and Sites of Significance

IAAC considered comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia, the mitigation measures proposed by the Proponent, and advice from expert federal and provincial authorities in identifying key mitigation measures[32] to be implemented by the Proponent for protection of physical and cultural heritage and sites of significance. IAAC considers the following mitigation measures and monitoring to be necessary to ensure the Project is not likely to cause significant adverse effects to physical and cultural heritage and sites of significance.

- Develop, prior to the Project commencing, and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Nova Scotia Communities, Culture, Tourism and Heritage and any other relevant authorities, a cultural resource management plan for any previously unidentified structures, sites or things of historical, archaeological, paleontological or architectural significance discovered within the SSA by the Proponent or brought to the attention of the Proponent by PLFN or another party. As part of the plan:
    - immediately halt work at the location of the discovery, except for actions required to be undertaken to protect the integrity of the discovery and delineate an area around the discovery as a no-work zone;
    - notify Nova Scotia Communities, Culture, Tourism and Heritage, Special Places Protection immediately to receive guidance on discovery, recording, transferring and safekeeping of previously unidentified structures, sites or things of historical, archaeological, paleontological significance in accordance with the *Special Places Protection Act* and associated policy; and
    - notify PLFN on behalf of the Mi'kmaq of Nova Scotia and IAAC within 24 hours of a discovery, and allow the PLFN on behalf of the Mi'kmaq of Nova Scotia to monitor archaeological works.
- Prior to the Project commencing, identify in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, opportunities to take part in monitoring project activities that may result in the discovery of any previously unidentified structures, sites or things of historical, archaeological, paleontological or architectural significance within the SSA, subject to applicable legislative or legal requirements.
- Prior to the Project commencing, and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, develop training for employees and contractors associated with Project activities that may involve physical ground disturbance. Training will be available during all phases of the Project and include:
    - how to identify any known sensitive locations of Mi'kmaq of Nova Scotia physical heritage features or structures, sites or things of historical, archaeological, paleontological or architectural significance within the SSA;
    - cultural sensitivity, including how to respect Indigenous Knowledge protocols, and keeping Indigenous knowledge confidential, if requested.

[32] For the purposes of its analysis with respect to mitigation measures and follow-up requirements in this report, IAAC has assumed that the arrangement by which PLFN leads on behalf of the Mi'kmaq of Nova Scotia will continue.

- Design and construct the containment cell in a manner such that the waste can be removed and the containment cell can be decommissioned.
- Prior to site preparation, in consultation with PLFN, establish an Advisory Committee co-led by PLFN, for the purpose of identifying technically and economically feasible alternative location(s) for the long-term storage of waste. The Proponent must strive to reach consensus with PLFN for all Advisory Committee activities, including the development and implementation of a Terms of Reference, including terms and provisions for dispute resolution. The Advisory Committee will identify a list of potential alternative locations for the long-term storage of the waste and these locations would be assessed for feasibility. Within one year of the issuance of the Decision Statement, IAAC will be notified of any technically and economically feasible alternative location(s) identified. The activities of the Advisory Committee will continue for 10 years, or until both parties agree in writing to terminate. PLFN may request the re-establishment of the committee after it has terminated.
- If a technically and economically feasible alternative location is identified by the Advisory Committee, the Proponent will notify IAAC with proposed changes to the Project, including decommissioning of the containment cell and moving waste to an alternative site. Subject to any regulatory approvals, permits, or appropriations, the Proponent will carry out the changes to the Project.

Additional mitigation measures, monitoring, and follow-up programs applicable to project-related effects to PLFN and the Mi'kmaq of Nova Scotia's physical and cultural heritage and sites of significance can be found in the following sections of this report: Fish and Fish Habitat (Section 5.1), Health Conditions (Section 5.3), and Current Use of Lands and Resources for Traditional Purposes (Section 5.5).

5.5 PLFN and the Mi'kmaq of Nova Scotia – Current Use of Lands and Resources for Traditional Purposes

The Project after applying mitigation measures, could cause residual adverse effects on current use of lands and resources for traditional purposes (traditional use) by PLFN and the Mi'kmaq of Nova Scotia, through changes in the terrestrial environment.

IAAC is of the view that the Project is not likely to result in significant adverse environmental effects on traditional use, after taking into account the proposed key mitigation measures, monitoring, and follow-up programs. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, and the views expressed by federal authorities and PLFN on behalf of the Mi'kmaq of Nova Scotia.

5.5.1 Proponent's Assessment and Views Expressed

The Proponent provided an assessment of effects on the Mi'kmaq of Nova Scotia, with additional specific analyses of economic and social effects, archaeological/ cultural effects, and human health. IAAC's summaries below for current use utilize information from the Proponent's assessments, as well as the Mi'kmaq Ecological Knowledge Study (MEKS) and PLFN Well-being Baseline Study, both included as appendices to the EIS.

Description of Existing Environment

Many of the informants who participated in the MEKS stated that a high level of distrust of harvesting any resources around Boat Harbour remains because of the contamination. PLFN are not currently pursuing traditional use activities such as gathering berries or medicines in the SSA. Currently, the members of PLFN travel to areas outside their community for hunting, fishing and gathering resources for subsistence. Hunting in the SSA is limited to fur-bearing species for their fur and not for sustenance.

Historical traditional use activities prior to the effluent treatment facility being operational (1967) are discussed in Section 1 (Introduction) of this report.

Prediction of Effects

The Proponent acknowledged the operation of the effluent treatment facility impacted the Mi'kmaq's traditional and spiritual connection to A'se'k and the introduction of contamination reduced the quality of country foods, and prevented the Mi'kmaq of Nova Scotia from engaging in traditional use activities within Boat Harbour and surrounding lands and waters. The Proponent stated the goal of the Project is to remediate Boat Harbour and impacted surrounding lands and waters, and to return A'se'k to a functioning tidal estuary as it was prior to effluent being discharged into Boat Harbour. The Proponent anticipates that once remediated, A'se'k would support healthy flora, fauna, bird, wildlife, and fish environments, and the Mi'kmaq of Nova Scotia would be able to resume traditional use and recreation activities in the future.

Changes in Access to Lands and Resources

Access to the majority of the SSA is currently restricted by fencing and signage, including the area of the containment cell. The Proponent acknowledged that during most phases of the Project, access to the SSA would be limited. The expansion and continued use of the existing containment cell for the long-term storage of hazardous waste would continue to restrict PLFN's ability to access this area of the SSA for traditional use. The Proponent stated that because the containment cell would be expanded vertically at the present site, there would be no further impact to the footprint or access to the containment cell location or surrounding lands and waters. The Proponent also stated that post-remediation, the lands within the SSA, excluding the containment cell, would be accessible for recreational and traditional use.

With respect to Boat Harbour, PLFN expressed their desire for the restoration of navigation. The Proponent noted the construction of a bridge to replace the causeway at Highway 348 would allow access to Boat Harbour for small boats, a design that incorporates PLFN's feedback. The modifications of access roads would potentially restrict access to portions of the wetlands in the SSA, therefore the Proponent incorporated the construction of a small span bridge.

The Proponent committed to the transfer of up to 173 hectares of provincially-owned lands to PLFN after the Project is completed to provide a form of accommodation to PLFN for any potential limitations in land use as a result of the continued existence of the vertically-expanded containment cell. However, PLFN stated that most of these lands were previously committed to before the commencement of the EA and should not be regarded as an accommodation for potential effects of the Project.

Changes to Quality and Availability of Resources

The Proponent anticipates that the Project would result in positive changes to the ecosystem, including changes to fish and fish habitat and migratory birds, and potentially restore the waters and lands in and

around Boat Harbour to a state that would enable PLFN to resume traditional use activities within the LSA.

The Proponent states that the Project will allow for the removal of contaminants within A'se'k which is in support of PLFN's vision for the healing of A'se'k and the surrounding lands, which would allow PLFN to use the lands for harvesting of traditional foods. The ability to use A'se'k and the surrounding lands for harvesting of traditional foods would help lead to long-term food security for PLFN. The Proponent acknowledges there is a perceived limitation in the restoration of traditional use due to the long-term storage of waste on-site in the vertically-expanded containment cell.

Two-thirds of the participants in the PLFN Well-being Baseline Study stated no, or they don't know, when asked if they believed that hunting, fishing, trapping and/or gathering activities can be restored around Boat Harbour. One participant of the PLFN Well-being Baseline Study responded:

> ***People just trap around here for fur. No one actually eats the meat around here". A boy stated, "I wouldn't eat it for like 200 years". One man shared "once it is restored and then we begin hunting…fish[ing], I'm thinking, I'll be kinda…weary of it. I'd be kind of nervous to eat it actually…[a]fter knowing what's been over there.***

The Proponent predicted that the overall quality of fish habitat is expected to improve in the long-term. During remediation activities the Proponent intends to remove fish in Boat Harbour and surrounding watercourses that are likely genetically compromised. The Proponent indicated that prior to the commencement of dredging activities, fish in Boat Harbour would be euthanized and directly impacted wetlands would be removed. PLFN expressed concern about the psychological trauma that euthanizing the fish may cause the community. The Proponent stated that although they will do their best to remove contaminated fish from Boat Harbour and surrounding wetlands, some fish exposed to contamination may remain in nearby watercourses.

PLFN expressed concern that project activities could impact the habitat of culturally important resources, especially those that are endangered (Atlantic salmon), threatened (American eel), or are species of special concern (striped bass), and any disturbance to their habitat could impact the Mi'kmaq's ability to harvest these resources in the future.

Additional information about the contamination of fish and wildlife, as it relates to human health and country foods, can be found in Section 5.3 (Health Conditions) of this report. Potential effects to fish and fish habitat, including commercial fisheries, are discussed in Section 5.1 (Fish and Fish Habitat) of this report.

Frequency of Traditional Use and Quality of Experience

The Proponent stated that the removal of contaminants would facilitate the healing of A'se'k and the surrounding lands and allow PLFN to use the lands for harvesting of traditional foods. The Proponent also

noted that there is a perceived limitation in the restoration of traditional land and resources use due to the long-term storage of waste in the containment cell.

A participant in the PLFN Well-being Baseline Study expressed the following view:

> ***… residents want the province to stop using the phrase "getting it back to its original state". One lady said in frustration, "it's never going to be back to its original state. Especially with the containment cell.***

As stated in the PLFN Well-being Baseline Study, a participant stated that the contamination of Boat Harbour has had wide-ranging impacts for PLFN*:*

> ***I do believe that Boat Harbour has affected us in every single way possible, spiritually, emotionally, physically. Our community members are sick, or suffering from cancer, autoimmune diseases. Some young women can't even have children. So, I do believe that it has affect[ed] us in all ways. I think if Boat Harbour was still A'se'k, I would be more culturally involved, more spiritual, more grounded to the community, and have more of a sense of culture and being more aware of our traditions. That my brothers would know how to hunt, they wouldn't have to go to Cape Breton Island. And just listening to…our Elders, our knowledge keepers…for my generation, for the youth, it's really important for [us] to hear your…stories and your traditions, and to keep that going. And I know even if remediation does happen that it's not trusted…at least it's going to be better and that toxic effluent is going to stop coming in. I don't know if everyone's going to trust it, but I think that's when our healing's going to start. It has to start somewhere, and I want a better…future for my kids, for my generation. Especially from…hearing the pain that you guys talk about…We all want a better future for our children and younger generation[s]. So, I really do want remediation to happen and I believe…that's when we are going to start healing and trying to become closer and just having a better life all together.***

Significance of Residual Effects

The Proponent concluded that the Project would result in an overall positive effect on the environment and increase the Mi'kmaq of Nova Scotia's ability to use the lands and resources for traditional purposes.

The Proponent stated that potentially negative residual effects from the Project to the Mi'kmaq of Nova Scotia would be related to the long-term storage of waste in the containment cell, and atmospheric emissions during the Project. The Proponent stated that considering the degree of these potential effects, in comparison to baseline conditions, the Project, including the long-term presence of the vertically-expanded containment cell in the SSA, would not result in significant adverse effects to the Mi'kmaq of Nova Scotia. The Proponent acknowledged that this determination is not consistent with the determination presented in the PLFN Well-being Baseline Study, which determined that until A'se'k is reclaimed impacts are considered significant, however, it is consistent with the methodology applied to all VCs.

The Proponent concluded that the overall residual effect to the Mi'kmaq of Nova Scotia would not be significant, given the mitigation, follow-up, and monitoring measures proposed.

5.5.2 IAAC Analysis and Conclusions

Analysis of the Effects

IAAC understands the lands and waters surrounding Boat Harbour were once an important area for traditional use by PLFN and the Mi'kmaq of Nova Scotia; however, due to the construction and operation of the effluent treatment facility and the resulting contamination, most traditional use activities in and around the SSA, including Boat Harbour, ceased. IAAC recognizes that the goal of the Project is to remediate Boat Harbour and impacted surrounding lands and waters, and to return it to a functioning tidal estuary with improvements to the health of flora, fauna, birds, wildlife, available for PLFN and the Mi'kmaq of Nova Scotia for traditional use and recreation activities in the future. The desire is for Boat Harbour to be returned to the condition it was before the effluent treatment facility was constructed, which would allow the community to begin to heal their spiritual and cultural connection to A'se'k.

Access to Lands and Resources

IAAC understands that access to portions of the SSA are currently restricted, including the land occupied by the containment cell. After remediation is complete, the lands within the SSA, excluding the vertically-expanded containment cell, would be physically accessible for recreational and traditional use.

IAAC acknowledges that if the vertically-expanded containment cell is decommissioned, PLFN may regain access to this area. As discussed in Section 5.4 (Physical and Cultural Heritage) of this report, the Proponent will be required to undertake measures minimizing the likelihood of the vertically-expanded containment cell remaining in the SSA permanently, including ensuring it is reconstructed in a manner such that the waste can be removed, and establishing an advisory committee in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia to seek out and assess potential alternative locations for the waste. If a suitable alternative location is found, the Proponent would be required to submit proposed project changes to IAAC, including the decommissioning of the containment cell and moving the waste to the alternative location. The Proponent will be required to carry out these changes, subject to any regulatory approvals, permits, or appropriations.

IAAC notes that it is the objective of the Proponent to remediate the remaining area of the SSA, including Boat Harbour, to contamination levels considered protective of human health; however, based on the finalization of the remedial objectives and approval under the Nova Scotia *Environment Act,* other areas of the SSA may still require administrative controls. Residual contamination and the potential need for administrative controls post-remediation is discussed further in Section 5.3 (Health Conditions) of this report.

IAAC acknowledges that the Project will restore navigation to Boat Harbour, which PLFN has identified as a desired outcome of the Project. IAAC notes that project components required to restore navigation, such as replacing the causeway at Highway 348 with a bridge, and the removal of the dam, may require approvals under the *Canadian Navigable Waters Act.*

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, residual effects to PLFN and the Mi'kmaq of Nova Scotia's access to lands and resources would be low to moderate in magnitude, long-term in duration, and reversible.

Quality and Availability of Resources for Traditional Use

IAAC agrees with the Proponent that the remediation would improve the quality of fish and fish habitat and the quality and availability of species for traditional use. However, IAAC acknowledges that PLFN and the Mi'kmaq of Nova Scotia may choose not to engage in traditional use and recreation activities because the lands and waters in and adjacent to Boat Harbour may still be contaminated or be perceived as contaminated. The presence of the vertically-expanded containment cell would likely heighten mistrust of the quality of resources in the area due to perceived and actual risks associated with the long-term storage of hazardous waste. As discussed in Section 5.4 (Physical and Cultural Heritage) of this report, the Proponent will be required to undertake measures minimizing the likelihood of the vertically-expanded containment cell remaining in the SSA permanently.

The Proponent would be required to complete follow-up monitoring to verify the accuracy of the EA and determine the effectiveness of mitigation measures, as described Sections 5.1 and 5.3 (Fish and Fish Habitat and Health Conditions) of this report.

Furthermore, Indigenous monitors and a third-party independent environmental monitor would be hired by the Proponent to observe, record, and report on the implementation of mitigation measures and follow-up monitoring. IAAC is of the view that follow-up monitoring, and the use of Indigenous and independent environmental monitors would potentially aid in reducing mistrust of the quality of resources in the area.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, residual effects to the quality and availability of resources for traditional use would be low to moderate in magnitude, long-term in duration, and reversible.

Frequency of Traditional Use and Quality of Experience

IAAC is of the view that the Project will result in the remediation of lands in the SSA, which in the long term will improve the quality of lands and resources, enabling PLFN to resume traditional use of the SSA (with the exception of the vertically-expanded containment cell location). However, based on information provided by PLFN on behalf of the Mi'kmaq of Nova Scotia, IAAC is of the view that it is unlikely traditional use activities would resume on these lands and waters due to the presence of the vertically-expanded containment cell. PLFN expressed that the vertically-expanded containment cell remaining in place permanently would remind the community of the hurt, pain, and suffering experienced due to the history of Boat Harbour. Its permanent presence, as well as the long-term maintenance activities required

(e.g., transporting leachate off-site, long-term monitoring) would diminish the quality of experience to such an extent that PLFN would likely avoid the SSA. As discussed in Section 5.4 (Physical and Cultural Heritage) of this report, the Proponent will be required to undertake measures minimizing the likelihood of the vertically-expanded containment cell remaining in the SSA permanently.

Given the proposed mitigation measures and the definitions of the environmental effects rating criteria in Appendix A, residual effects to the frequency of traditional use and quality of experience due to the presence of the vertically-expanded containment cell would be high in magnitude, long-term in duration, continuous, and reversible.

Conclusions

IAAC is of the view that the Project is not likely to cause significant adverse environmental effects to the current use of lands and resources for traditional purposes by PLFN and the Mi'kmaq of Nova Scotia after taking into account the implementation of the key mitigation measures identified below.

Key Mitigation Measures and Monitoring for the Current Use of Lands and Resources for Traditional Purposes

IAAC considered comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia, the mitigation measures proposed by the Proponent, and advice from expert federal and provincial authorities in identifying key mitigation measures to be implemented by the Proponent. IAAC considers the following mitigation measures and monitoring to be necessary to ensure the Project is not likely to cause significant adverse effects to the current use of lands and resources used for traditional purposes by PLFN and the Mi'kmaq of Nova Scotia.

- Prior to site preparation and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, retain the services of Indigenous monitors, while taking into account provincial procurement policies and agreements, to observe, record, and report on the implementation of the mitigation measures and follow-up programs required of the Proponent. Prior to retaining the services of Indigenous monitors, the Proponent will undertake a collaborative process to determine, in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, the scope, purpose, and objectives of the participation of Indigenous monitors, and that information must be submitted to IAAC prior to the Project commencing. As part of this process, the Proponent must determine:
    - how each Indigenous monitor shall be involved in monitoring, including the location, frequency, timing, and duration of their participation;
    - how the Proponent will support the participation of Indigenous monitors, including through the provision of training (including safety or skills certifications), equipment (including personal protective equipment), and access to the SSA; and
    - how information obtained from Indigenous monitors will be reported to PLFN and the Mi'kmaq of Nova Scotia, relevant authorities, and IAAC, as well as how information obtained from Indigenous monitors has been considered by the Proponent, including a rationale for why any action recommended by Indigenous monitors has, or has not been taken.
- Prior to site preparation and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, retain the services of a third-party independent environmental monitor, while taking into account provincial procurement policies and agreements, to independently observe and report on the implementation of the mitigation measures and follow-up programs required of the Proponent from

the start of site preparation, and continuing through post-closure. The independent environmental monitor will report to the Proponent, PLFN and the Mi'kmaq of Nova Scotia, and IAAC about the implementation of mitigation measures or follow-up programs. Information obtained by the independent environmental monitor will be reported to IAAC at a frequency and format determined in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and IAAC, taking into account any reporting approach provided by the independent environmental monitor.

Additional mitigation measures, monitoring, and follow-up programs applicable to project-related effects to the current use of lands and resources used for traditional purposes by PLFN and the Mi'kmaq of Nova Scotia can be found in the following sections of this report: Fish and Fish Habitat (Section 5.1), Health Conditions (Section 5.3), Physical and Cultural Heritage (Section 5.4), and Accidents and Malfunctions (Section 6.1).

5.6 Federal Lands

The Project after applying the proposed mitigation measures could cause residual effects on federal lands through changes to air quality, the acoustic environment, groundwater quality, wetlands, and PLFN and the Mi'kmaq of Nova Scotia's health conditions, physical and cultural heritage, and current use of lands and resources for traditional purposes.

IAAC is of the view that project effects on the other valued components identified in this report are unlikely to occur on federal lands, given the negligible to low magnitude and limited geographic extent of the Project's anticipated residual effects on these components. IAAC therefore excluded the other valued components from the analysis of effects to federal lands.

IAAC is of the view that the Project is not likely to cause significant adverse effects on federal lands, after taking into account the Proponent's proposed mitigation, follow-up, and monitoring measures and the proposed key mitigation measures discussed in Section 5.1 (Fish and Fish Habitat), Section 5.2 (Migratory Birds), Section 5.3 (Health Conditions), Section 5.4 (Physical and Cultural Heritage), Section 5.5 (Current Use of Lands and Resources for Traditional Purposes), and Section 6.1 (Accidents and Malfunctions) of this report. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, and the views expressed by federal and provincial authorities, and PLFN on behalf of the Mi'kmaq of Nova Scotia.

5.6.1 Proponent's Assessment and Views Expressed

Description of the Existing Environment

The Boat Harbour effluent treatment facility is located adjacent to Indian Reserves 24, 24G, and 37 (Figure 1). Each of these reserve lands are located partially within the SSA and entirely within the LSA. PLFN currently reside on Indian Reserve 24, located directly adjacent to and north of Boat Harbour, at the northern boundary of the SSA. Indian Reserves 24G and 37 are located on the southern portion of the SSA, on either side of the containment cell.

The Proponent stated that project activities may impact these federal lands located within the SSA and LSA through changes to air quality and odour, the acoustic environment, groundwater, and wetlands. Effects to these components could cause adverse effects to PLFN and the Mi'kmaq of Nova Scotia's

health conditions, physical and cultural heritage, and current use of lands and resources for traditional purposes.

Changes to Air Quality and Odour

The Proponent indicated that project activities may cause temporary degradation of air quality within the SSA, including portions of Indian Reserves 24, 24G, and 37 during all project phases due to vehicle exhaust and dust emissions from transportation or operation of heavy equipment.

With the exception of total suspended particles, PM_{10}, and iron, the Proponent predicted that during the Project, COPCs concentrations in Indian Reserves 24, 24G, and 37 would be below applicable air quality criteria.[33] The Proponent stated that elevated concentrations of TSP, PM_{10}, and iron related to truck traffic on the access road would be limited primarily to a forested area near the entrance to the SSA, which is located near Indian Reserve 37.

The Proponent predicted that the Project would potentially result in an increase of odours from disruption of contaminated sediment. Odour modeling predicted hydrogen sulphide exceedances could occur during the relocation of existing waste from the containment cell, and the dewatering of dredged sediment. This exceedance was located near Indian Reserves 24G and 37, however they were predicted to occur prior to the post-closure phase, when the SSA will not be in use by PLFN and the Mi'kmaq of Nova Scotia.

The Proponent predicted that potential residual effects to air quality would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Additional details regarding potential project effects to the Mi'kmaq of Nova Scotia's health conditions as they relate to air quality and odour can be found in Section 5.3 (Health Conditions) of this report.

Changes to Acoustic Environment

Increases in noise from project-related traffic, including heavy machinery, would occur during all phases of the Project, and would extend to the LSA including Indian Reserves 24, 24G, and 37. The Proponent stated that the effects on sensitive receptors, including PLFN's community (Indian Reserve 24) from noise caused by the Project are anticipated to be low in magnitude. Indian Reserves 24G and 37 would also experience increased noise during all phases of the Project however these lands are currently not used or occupied by PLFN and the Mi'kmaq of Nova Scotia. . Any construction or operational noise would be below Nova Scotia Environment and Climate Change's *Guidelines for Environmental Noise Measurement and Assessment* at the worst-case receptor locations. Increases in noise related to the ongoing maintenance of the containment cell would occur in the post-closure phase. The increased noise levels would have the potential to affect PLFN and the Mi'kmaq of Nova Scotia, should they choose to use Indian Reserves 24G and 37, however these noise levels would be lower than noise levels predicted during the earlier phases of the Project.

The Proponent predicted that potential residual effects to the acoustic environment would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Additional details

[33] Ambient air quality impacts were assessed by the Proponent using three criteria: Nova Scotia Ambient Air Quality Criteria, Canadian Ambient Air Quality Standards, and Ontario Ambient Air Quality Criteria

regarding potential project effects to the Mi'kmaq of Nova Scotia's health conditions as they relate to changes to the acoustic environment can be found in Section 5.3 (Health Conditions) of this report.

Changes to Groundwater

The Proponent predicted that the Project may result in adverse residual effects to groundwater during all project phases. Groundwater could be impacted by accidents or malfunctions, including failure of the containment cell liner or a hazardous materials spill. If the containment cell liner failed, there would be potential for groundwater impacts that could extend to Indian Reserves 24G and 37. A hazardous materials spill could occur anywhere within the SSA depending on the project activity. PLFN currently sources drinking water from a groundwater wellfield located 500 metres east of the SSA. The SSA is not hydraulically connected to PLFN's groundwater wellfield and groundwater in the SSA is not currently consumed, therefore the Proponent does not anticipate effects to drinking water from the Project. The Proponent did not anticipate residual project effects to groundwater on federal lands given the proposed mitigation, follow-up, and monitoring measures.

The Project may require the implementation of a potable water exclusion zone which would restrict future installation of potable wells near Indian Reserves 24G and 37. PLFN expressed that if a potable water exclusion zone is required, this could have implications to PLFN should the community wish to expand in the future.

The Proponent predicted that potential residual effects to groundwater would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Additional details regarding potential project effects to groundwater can be found in Section 5.3 (Health Conditions) and Section 6.1 (Accidents and Malfunctions) of this report.

Changes to Wetlands

The Project may result in adverse residual effects to wetlands that may extend to a portion of wetland on federal lands. The Proponent noted that although the extent of remediation in the wetlands is not finalized, the remediation of wetland 13a may encroach onto Indian Reserve 37. Remediation activities (i.e., dredging), and the removal of the dam and reintroduction of tidal influence to the SSA could result in the temporary loss and alteration to wetlands, which may extend onto federal lands.

Environment and Climate Change Canada stated that due to the potential loss of wetlands on federal lands, the Proponent must meet the goals of the *Federal Policy on Wetland Conservation* when developing the wetland compensation plan required by Nova Scotia Environment and Climate Change, as discussed in Section 5.1 (Fish and Fish Habitat) of this report.

The Proponent predicted that potential residual effects to wetlands would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Additional details regarding potential project effects to wetlands can be found in Section 5.1 (Fish and Fish Habitat) and Section 5.2 (Migratory Birds) of this report.

Changes to the Mi'kmaq of Nova Scotia's Health Conditions, Physical and Cultural Heritage, and Current Use of Lands and Resources for Traditional Purposes

The Project may result in changes to PLFN and the Mi'kmaq of Nova Scotia's health conditions, physical and cultural heritage, and current use of lands and resources for traditional purposes due to changes in air quality, the acoustic environment, groundwater, and wetlands.

PLFN expressed that they are unable to use the lands on Indian Reserves 24G and 37 due to their proximity to the containment cell. The Project may require the implementation of a potable water exclusion zone near the aeration stabilization basin and containment cell, which could restrict future installation of potable wells in Indian Reserves 24G and 37. PLFN expressed that if a potable water exclusion zone is required, this could also have implications to PLFN should the community wish to expand in the future.

The Proponent predicted that potential residual effects to the Mi'kmaq of Nova Scotia would not be significant, given the mitigation, follow-up, and monitoring measures proposed. Additional details regarding potential project effects to PLFN and the Mi'kmaq of Nova Scotia can be found in Section 5.3 (Health Conditions), Section 5.4 (Physical and Cultural Heritage), Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report.

5.6.2 IAAC Analysis and Conclusions

IAAC is of the view that the Project could result in changes to air quality, the acoustic environment, groundwater, and wetlands on federal lands. IAAC acknowledges that project-related changes to air quality, the acoustic environment, groundwater, and wetlands on federal lands could result in adverse effects to PLFN and the Mi'kmaq of Nova Scotia, including mental health and well-being, physical and cultural heritage, and current use of lands and resources for traditional purposes.

IAAC acknowledges that approval from Indigenous Services Canada, which requires a Band Council Resolution from PLFN, is required for any disturbance that occurs on Indian Reserve land. Indigenous Services Canada also recommended the Proponent work with PLFN on behalf of the Mi'kmaq of Nova Scotia and Indigenous Services Canada to ensure the appropriate permits are in place for any access required to reserve lands.

IAAC is satisfied that the Proponent adequately considered the potential effects of the Project on federal lands and that the proposed mitigation, follow-up, and monitoring measures proposed by the Proponent are appropriate to address potential adverse effects on federal lands.

IAAC is of the view that the Project is not likely to cause significant adverse effects on federal lands, after taking into account the proposed key mitigation measures identified below.

Key Mitigation Measures and Monitoring to Avoid Significant Effects and Follow-Up Program Requirements

IAAC considers the key mitigation measures, monitoring, and follow-up programs discussed in Section 5.1 (Fish and Fish Habitat), Section 5.2 (Migratory Birds), Section 5.3 (Health Conditions), Section 5.4

(Physical and Cultural Heritage), Section 5.5 (Current Use of Lands and Resources for Traditional Purposes), and Section 6.1 (Accidents and Malfunctions) of this report to be necessary to ensure there are no significant adverse effects to federal lands.

6 Other Effects Considered

6.1 Effects of Accidents and Malfunctions

Paragraph 19(1)(a) of CEAA 2012 requires that the EA take into account the environmental effects of accidents and malfunctions that may occur in connection with the Project.

IAAC is of the view that the Proponent adequately considered potential environmental effects as a result of accidents and malfunctions. IAAC is of the view that the Project is not likely to result in significant adverse environmental effects from accidents and malfunctions, after taking into account the proposed key mitigation measures, monitoring, and follow-up programs. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, monitoring, and follow-up measures, the views expressed by federal and provincial authorities, and PLFN on behalf of the Mi'kmaq of Nova Scotia.

6.1.1 Proponent's Assessment and Views Expressed

Prediction of Effects

There is potential for accidents and malfunctions to occur throughout the Project, which could lead to adverse impacts on the Project and its surrounding environment. The Proponent has described the potential effects of project-related accidents and malfunctions, as well as corresponding preventative and response measures.

Containment Cell Failure

The Proponent stated that a containment cell malfunction, either due to the malfunction of the cell liner or the final cover, could result in adverse effects to air quality, groundwater, surface water, and PLFN and the Mi'kmaq of Nova Scotia. A malfunction involving the containment cell liner could result in undetected leaks of leachate into groundwater and the receiving environment. A failure of the final cover of the containment cell could result in increased water infiltration, which could subsequently increase leachate generation and the potential of a liner failure, and increase the potential for landfill gasses to be released into the atmosphere.

PLFN expressed concern regarding the long-term storage of hazardous waste within the vertically-expanded containment cell, including the potential for an accident or malfunction to impact groundwater. The Proponent stated that the likelihood for containment cell failure would be minimized through standard design practices and monitoring during its construction. Once the containment cell is under final cover, the liner, leachate collection system, and final cover (including a passive venting system) would be inspected annually. Leachate levels on the base liner would be monitored continuously, and maximum leachate levels would be established pursuant to the Nova Scotia *Environment Act*, and adhered to. Landfill gas monitoring at the containment cell, as described in Section 5.3 (Health Conditions) of this report, would be used to ensure the passive venting system associated with the containment cell is working as intended. If a failure of the containment cell liner or final cover occurred, procedures outlined in an emergency response plan would be implemented, and repairs would be made as soon as possible.

The Proponent predicted that the potential environmental effects of a containment cell failure on valued components would not be significant, given the mitigation, follow-up, and monitoring measures proposed.

Dredge Line Failure

The Proponent predicted that during dredging activities there would be potential for an accidental discharge of contaminated sediment from a dredge line failure within the SSA, due to a punctured dredge line or unsecured dredge line connection. An accidental discharge of contaminated sediments could impact groundwater, fish and fish habitat, other wildlife species, and PLFN and the Mi'kmaq of Nova Scotia.

The Proponent stated that this risk would be managed through regular inspections of the equipment and dredge line, and the development of an on-site emergency response team to manage spills and leaks. Should an accidental discharge of contaminated sediments occur within the SSA, contingency measures would be implemented that would include immediately stopping dredging activities, installing temporary silt curtains to limit sediment transport in the water column, and raising the dam to allow time for the contaminated sediments to settle before discharge. The Proponent also noted that the majority of the dredge line is designed to float on water during dredging activities to minimize the potential for any impacts on land. The Proponent committed to the development of an emergency response plan before the start of the Project, which would include a dredging contingency plan that outlines the conditions under which dredging activities would cease, the procedures to be followed to rectify dredging issues, and the incident reporting protocol.

The Proponent predicted that with the incorporation of best management practices, proposed mitigation measures, training of on-site personnel, and the development of an emergency response plan, any accidental discharge of contaminated sediments from a dredge line failure would be minor, of short duration, and would not cause significant adverse effects.

Leachate Systems Failures

The Proponent stated that a release of effluent due to a system malfunction or accident at the temporary leachate treatment facility, or the leachate storage tank and tanker truck during post-remediation, could potentially impact groundwater, soil, and surface water, which could result in impacts to fish and fish habitat and PLFN and the Mi'kmaq of Nova Scotia. The Proponent stated that the risk of release of off-specification effluent would be reduced by regular inspections of equipment, including of the effluent conveyance piping, preparation of a contingency plan, and the implementation of an emergency response plan. The Proponent predicted that given the mitigation and monitoring measures proposed, any discharge of effluent exceeding applicable discharge criteria would be small and of short duration, and would not cause significant adverse effects.

During post-remediation the leachate storage tank levels would be monitored and leachate tanker trucks would be loaded over an impermeable pad. A spill management plan would be prepared prior to site preparation and implemented in the event of a leak or overflow.

The Proponent predicted that given the mitigation and monitoring measures proposed, a leak or overflow of the leachate storage tank or leachate tanker truck would be of short duration and would not cause significant effects to valued components.

Stormwater Management Pond Failure

An overflow of contaminated water from the stormwater management pond could result in impacts to downstream environments including groundwater, soil, or wetlands. The Proponent noted that the stormwater management pond was designed to accommodate a 1-in-100-year flood event. The stormwater management pond water levels would be monitored using level-control instrumentation and level alarms, and a weir would maintain water levels. The stormwater management pond would also be visually inspected before and after large precipitation events.

The Proponent predicted that potential environmental effects to valued components due to a stormwater management pond failure would be unlikely and would not cause significant effects to valued components given these propose monitoring measures, because any failure would be detected within a relatively short timeframe.

Erosion and Sediment Control Failure

Erosion and sediment control measure failure during site preparation, remediation, or decommissioning activities could result in silt-laden water entering watercourses or wetlands within the SSA, potentially impacting fish and fish habitat, species at risk, and PLFN and the Mi'kmaq of Nova Scotia. Erosion and sediment control measures (e.g., use of geotextile fabric, silt fences) would be used to minimize the potential for silt-laden water to enter watercourses or wetlands within the SSA in exceedance of project specific TSS targets[34] during site preparation activities. The Proponent stated that this scenario would be unlikely to cause long-term TSS exceedances, as a failure of erosion or sediment controls would be detected through standard and routine inspection and monitoring, and repairs would be made quickly.

PLFN expressed concern that contaminated sediments released into the Northumberland Strait due to the decommissioning of the dam, or due to accidents and malfunctions, may impact migratory bird species at risk that use the Northumberland Strait. The Proponent stated that if an erosion and sediment control measure failure, such as the failure of silt curtains used to separate dredging areas increased the TSS within a watercourse or wetland prior to the decommissioning of the dam, the water level control structure at the causeway would be used to prevent water discharge from Boat Harbour into the estuary. This would allow suspended solids to settle before the water is released into the estuary. Environment and Climate Change Canada stated that wildlife response plans for any scenario that may impact wildlife, including scenarios resulting in the potential exposure of migratory birds to contaminated waters, should be incorporated into the Proponent's emergency response plan.

The Proponent predicted that the potential environmental effects to fish and fish habitat due to an erosion or sediment control failure would be low in magnitude and temporary given the mitigation and monitoring measures proposed because any failure would be detected within a relatively short timeframe.

Hazardous Materials Spill

Hazardous material spills could occur within or outside the SSA. Such spills within the SSA could arise from equipment leakage, vehicle accidents, ruptured fuel storage tank, or spillage during refueling and would potentially result in effects to groundwater, soil, surface water, and air quality, which would

[34] Targets for TSS are discussed further in Section 5.1 (Fish and Fish Habitat)

potentially adversely impact wildlife, including fish and fish habitat and migratory birds, through ingestion or uptake of contaminants. The Proponent committed to developing a fuel and hazardous materials spills contingency plan prior to the Project commencing. In addition to adhering to the *Transportation of Dangerous Goods Act*, the Proponent proposed several mitigation measures to prevent an off-site trucking accidental spill, such as training all drivers in emergency response, and providing appropriate spill containment and neutralizing agents in transport vehicles. The Proponent noted that they would also adhere to the applicable provincial legislation and protocols through Nova Scotia Environment and Climate Change, as well as federal regulations, where appropriate.

The Proponent identified the worst-case off-site trucking accident scenario as a full tanker load of petroleum. The Proponent stated that environmental effects to the environment would be short-term and reversible, as a spill would effectively be flushed downstream and become diluted during periods of heavy rain or high flow events. The Proponent stated that if a spill did occur, it would need to occur near a watercourse where a sensitive species is present during a sensitive life stage for it to cause a significant environmental effect. The Proponent stated that the probability of this combination of events occurring is low, and therefore the residual environmental effects would not be significant. The Proponent also stated that any accidental spills would be effectively managed by the requirements of the spill management plan, which would allow the recovery of an affected watercourse in one to two years, including the re-establishment of resident fish populations. Fisheries and Oceans Canada disagreed with the Proponent's assumption that a spill occurring in an area containing sensitive species and life stages is an unlikely combination of events, and further advised that all fish species and life stages are protected under the *Fisheries Act.* Fisheries and Oceans Canada also disagreed with the Proponent's assessment that effects to the environment due to a spill into a waterbody would be reversible because it would be flushed out by heavy rain or high flow events and that resident fish populations would re-establish within one to two years.

Environment and Climate Change Canada stated that the Proponent should include a wildlife response plan for scenarios that may impact wildlife (including migratory birds), such as fuel and hazardous materials spills. The Proponent stated that procedures for refueling on or near water within the SSA would be developed, which would include the requirement for equipment to be fitted with emergency controls and for floating spill containment booms to be available during refueling. Furthermore, should a spill occur within the SSA, the stormwater collection system would likely prevent the spill from migrating to the LSA or beyond.

The Proponent predicted that an on-site hazardous material spill impacting the surrounding environment would be unlikely given the mitigation and monitoring measures proposed, including the implementation of the emergency response and spill management plans

Fire

The Proponent stated that a fire could result from an equipment malfunction, human error, or a vehicle accident. A fire could result in direct fatalities of wildlife and its habitat, including fish and migratory birds. The Proponent stated that a fire could also destroy vegetation near watercourses, and/or could cause a temporary increase in water temperatures and sedimentation which could impact wildlife, including fish and fish habitat and migratory birds. Emissions from the fire would also have the potential to affect the atmospheric environment.

The Proponent proposed mitigation measures including regular maintenance of equipment and training personnel in procedures related to fuel transfer, hazardous materials, and fire response. The Proponent also committed to developing a fire response contingency plan to prevent fire hazards on site and protocols if a fire did occur. The Proponent predicted that the potential environmental effects of a fire on valued components would not be significant considering the mitigation, prevention, and response procedures put in place.

Significance of Residual Effects

The Proponent stated that the potential effects of accidents and malfunctions would be mitigated by the implementation of best management practices, standard mitigation measures, and training of on-site personnel. The Proponent committed to the development and implementation of emergency response and contingency plans. Based on these measures, the Proponent predicted that the potential environmental effects caused by accidents and malfunctions during all phases of the Project would not be significant, or would be significant but unlikely to occur.

6.1.2 IAAC Analysis and Conclusion

Analysis of the Effects

IAAC has concerns with the Proponent's identification and assessment of potential accidents and malfunctions associated with the Project. However, IAAC is of the view that, taking into account project design considerations and the mitigation, monitoring, and follow-up measures proposed by the Proponent, the likelihood of potential accident and malfunction scenarios occurring would be low.

IAAC shares Fisheries and Oceans Canada's concern with the Proponent's assessment that if a spill occurred near or in a water body, resident fish populations would re-establish within one to two years because contaminants will be flushed downstream and become diluted during heavy rain or high flow events. However, IAAC understands that the Proponent will develop emergency response and contingency plans that will include measures to mitigate potential effects from potential accident and malfunction scenarios. IAAC recommends that the Proponent engage with provincial and federal authorities, including Nova Scotia Environment and Climate Change, Environment and Climate Change Canada, Fisheries and Oceans Canada, and PLFN and the Mi'kmaq of Nova Scotia when developing emergency response and contingency measures to address potential effects of accidents and malfunctions on the environment and the PLFN and Mi'kmaq of Nova Scotia. IAAC notes that Environment and Climate Change Canada has guidance documents to protect wildlife in case of an accident, such as a hazardous materials spill, which should be taken into account by the Proponent during the preparation of any emergency response and contingency plans.

Conclusions

IAAC is of the view that the Project is not likely to cause significant adverse environmental effects due to accidents and malfunctions, taking into account the implementation of the mitigation, monitoring, and follow-up measures proposed by the Proponent and the implementation of the key mitigation measures identified below.

Key Mitigation Measures and Monitoring to Avoid Significant Effects from Accidents and Malfunctions

IAAC considered comments received from PLFN on behalf of the Mi'kmaq of Nova Scotia, the mitigation measures proposed by the Proponent, and advice from expert federal and provincial authorities in identifying key mitigation measures to be implemented by the Proponent. IAAC considers the following mitigation measures to be necessary to ensure the Project is not likely to cause significant adverse environmental effects to fish and fish habitat, migratory birds, species at risk, and PLFN and the Mi'kmaq of Nova Scotia, as a result of accidents and malfunctions.

Key Mitigation Measures

- Prior to site preparation and in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, Environment and Climate Change Canada, and relevant authorities, develop and implement an emergency response plan in relation to each phase of the Project. The plan must include:
  - a description of the types of accidents and malfunctions that may cause adverse environmental effects during that phase, including infrastructure malfunctions or failures, and exposure of migratory birds to harmful substances in water or sediments;
  - the mitigation and management measures to be implemented in response to each type of accident or malfunction to mitigate any adverse environmental effect caused by the accident or malfunction, including measures for the response, protection, and rehabilitation of migratory birds, while taking into account Environment and Climate Change Canada's *Guidelines for Effective Wildlife Response Plans*; and
  - for each type of accident and malfunction, a description of the roles and responsibilities of the Proponent and each relevant authority in implementing the measures to mitigate any adverse environmental effect caused by the accident or malfunction, and for responding to an accident or malfunction.
- In consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia, develop a communication plan for accidents and malfunctions in relation to the Project describing the types of accidents and malfunctions requiring the Proponent to notify PLFN and the Mi'kmaq of Nova Scotia, the manner by which PLFN and the Mi'kmaq of Nova Scotia is notified of these accidents or malfunctions and of opportunities to assist in the response. to the accident or malfunction.
- In the event of an accident or malfunction with the potential to cause adverse environmental effects, implement measures to remedy the accident or malfunction and notify relevant authorities with responsibilities related to emergency response in accordance with legislative and regulatory requirements, and:
  - notify PLFN and the Mi'kmaq of Nova Scotia of the accident or malfunction in the manner identified in the communications plan for accidents and malfunctions and notify IAAC no later than 24 hours following the accident or malfunction;
  - submit a report to IAAC, PLFN, and the Mi'kmaq of Nova Scotia no later than 60 days after the accident or malfunction occurred, including a description of the accident or malfunction, the resulting adverse environmental effects, views from PLFN and the Mi'kmaq of Nova Scotia, advice from relevant authorities with respect to the accident or malfunction, a description of any changes made to avoid a subsequent occurrence of the accident or malfunction, and details concerning the implementation of the emergency response plan.

Additional mitigation measures, monitoring, and follow-up programs applicable to project-related effects from accidents and malfunctions can be found in Section 5.1 (Fish and Fish Habitat), Section 5.3 (Health Conditions), and Section 6.2 (Effects of the Environment on the Project) of this report.

6.2 Effects of the Environment on the Project

Paragraph 19(1)(h) of CEAA 2012 requires that the EA take into account any changes to the Project that may be caused by the environment, including climate change, extreme weather conditions, and seismic events.

IAAC is of the view that the Proponent adequately considered potential effects of the environment on the Project and that the Proponent's proposed mitigation measures, monitoring, and follow-up programs and the key mitigation measures identified by IAAC would adequately address potential effects of the environment on the Project. IAAC's conclusions are based on an analysis of the Proponent's assessment, including the Proponent's proposed mitigation, follow-up, and monitoring measures, and views expressed by federal and provincial authorities and the Mi'kmaq of Nova Scotia.

6.2.1 Proponent's Assessment and Views Expressed

The Proponent indicated that environmental factors, including those discussed below, may result in damage to project infrastructure and could increase the potential for accidents and malfunctions. Potential adverse environmental effects from accidents and malfunctions of project infrastructure are discussed in Section 6.1 (Accidents and Malfunctions) of this report.

Prediction of effects

Climate Change and Extreme Weather Conditions

The Proponent noted that due to the short duration of the site preparation and construction, remediation, and decommissioning and abandonment, and closure phases of the Project, approximately seven years, its assessment of potential effects on the Project due to climate change and extreme weather conditions was limited to longer-term infrastructure which will remain in the SSA after the completion of the Project (e.g., bridge, access roads, and the containment cell).

PLFN requested that the Proponent consider the potential impacts of sea level rise due to climate change on the Project. The Proponent indicated that the RSA is expected to experience significant sea level rise. The predicted sea level rise allowances (the height that proposed coastal infrastructure designs would be required to be raised in order to accommodate future sea level rise) at Pictou, Nova Scotia, would be 0.96 metres by the year 2100. The predicted one-in-100 year storm surge event[35] would result in a sea level rise of three metres at the proposed bridge location. The Proponent concluded that sea level rise and storm surge events are unlikely to impact the containment cell because it is located approximately eight metres above the current high-water mark. The Proponent also indicated that the bridge has been

[35] One-in-100-year event refers to an event that has a one percent probability of occurring in any given year.

designed to accommodate the predicted year 2100 sea level rise allowances and the predicted one-in-100-year storm surge event.

Precipitation within the RSA is expected to increase, including less frequent but more intense storm events. Increased precipitation would not be expected to impact leachate quantity or quality generated from the containment cell because in the post-closure phase and beyond, the containment cell would be covered, which would greatly reduce the infiltration of precipitation into the containment cell. The stormwater management system for the containment cell, which includes a stormwater management pond and runoff ditches, was designed to accommodate a one-in-100-year storm event and the containment cell liner was designed to prevent leachate from entering the groundwater. Given the permanence of the containment cell and increasing flood risk potential, Nova Scotia Environment and Climate Change expressed concern with whether the Proponent considered how increasing precipitation and risk of extreme weather events in the design of the containment cell and associated stormwater management system. The Proponent confirmed that the design accounted for the year 2080 projected precipitation levels, with an additional six percent contingency capacity to account for uncertainties in future precipitation predictions.

The Proponent stated that most of the potential effects to the Project due to climate change or extreme weather would be addressed through compliance with applicable design standards (e.g., *National Building Code of Canada*) and project design. For example, dredging activities would occur in phases to minimize potential effects from storm surges overriding the dam during remediation and a proactive monitoring, maintenance and safety management program will be put in place to minimize impacts from weather and storm events. Additionally, the Proponent stated that a detailed stormwater management plan would be developed. The Proponent noted *Ontario Regulation 232/98* for landfills would also be adhered to, however Nova Scotia Environment and Climate Change informed the Proponent that these regulations are applicable only to municipal waste disposal and are not suitable for the hazardous waste storage for this Project. The province does not currently have guidelines specific to hazardous waste disposal facilities, however the guidelines of other jurisdictions may be used when assessing the Project's design under the provincial approval process pursuant to the Nova Scotia *Environment Act*.

The Proponent predicted that climate change is unlikely to have a significant effect on the Project prior to the post-closure phase because most existing SSA infrastructure would be removed, as discussed in Section 2.3 (Project Components and Activities) of this report. For longer-term infrastructure components like the containment cell and bridge, climate change factors, such as sea level rise and extreme storm events, were incorporated into the design of the Project. The Proponent concluded that potential effects to the Project due to climate change and extreme weather changes would not be significant, given the mitigation, follow-up, and monitoring measures proposed.

Seismic Events

The Proponent stated that an earthquake would have the potential to impact the Project due to slope and liner failures at the containment cell, bridge failure, and other infrastructure damage caused by ground vibrations. Site infrastructure, such as the bridge, would be built to the *National Building Code of Canada*, which sets standards for each seismic zone and would aid in mitigating damage to infrastructure or injury to site workers.

The Proponent predicted that there was a low probability of a seismic event occurring in the vicinity of the Project that would be severe enough to cause major damage or disruption given the SSA is in an area

with low seismic potential and no seismic activity had been recorded in the RSA. The Proponent concluded that potential effects to the Project due to seismic events would not be significant, given the mitigation, follow-up, and monitoring measures proposed.

6.2.2 IAAC Analysis and Conclusions

Analysis of the Effects

IAAC is of the view that the Proponent adequately characterized the potential effects of the environment on the Project. IAAC concurs with the Proponent's determination that effects of the environment on the Project due to climate change, extreme weather, and seismic events would be minimized through design considerations and compliance with the appropriate standards to prevent damage from environmental forces. Furthermore, IAAC is satisfied that the location of the vertically-expanded containment cell will be at a higher elevation than the predicted long-term local sea level rise and predicted sea level rise due to an extreme storm surge event.

IAAC recognizes that the Proponent focused its assessment on the potential effects to infrastructure within the SSA during the post-closure phase. IAAC agrees that the likelihood of climate change directly affecting the Project prior to the post-closure phase is low, however extreme weather events within the SSA may occur. As described in Section 6.1 (Accidents and Malfunctions) of this report, the Proponent is required to develop an emergency response plan in relation to each phase of the Project which would include measures to be implemented in response to accidents and malfunctions, regardless of the cause.

Conclusions

IAAC is of the view that the project design and mitigation measures proposed by the Proponent and the key mitigation measures, monitoring, and follow-up programs outlined in Section 5.1 (Fish and Fish Habitat), Section 5.3 (Health Conditions), and Section 6.2 (Effects of the Environment on the Project) would avoid or reduce potential effects of the environment on the Project. Additional mitigation measures, monitoring, or follow-up programs are not required.

6.3 Cumulative Environmental Effects

IAAC is of the view that the Project, in combination with past, present, and reasonably foreseeable projects and activities, is not likely to cause significant adverse cumulative effects on fish and fish habitat and PLFN and the Mi'kmaq of Nova Scotia, and that additional mitigation measures or follow-up programs are not required. IAAC's conclusions are based on an analysis of the Proponent's cumulative effects assessment and the views expressed by federal authorities and PLFN on behalf of the Mi'kmaq of Nova Scotia. IAAC is of the view that effects on the other valued components identified in this report are unlikely to act in combination with the effects of other past, present, or reasonably foreseeable projects or activities, given the low magnitude or limited geographic extent of the Project's anticipated residual effects on these components. IAAC therefore excluded other valued components from the analysis of cumulative effects.

6.3.1 Proponent's Assessment and Views Expressed

The past, present, and reasonably foreseeable projects and activities that the Proponent identified as potentially interacting with valued components of the Project within the spatial and temporal boundaries are presented in Table 3. The location of each project is shown in Figure 10. It should be noted that the Proponent's cumulative effects assessment included the proposed construction of a new effluent treatment facility, which would allow the pulp mill (which was placed into long-term hibernation in 2020) to resume operations. However, since the submission of the EIS, Northern Pulp withdrew the proposed new effluent treatment facility from the provincial assessment process and later announced that they are no longer planning to resume operations at the pulp mill. Additionally, the Highway 104 Twinning Project, which was included as a future project in the Proponent's assessment of cumulative effects, was completed in 2023. Potential effects of this project identified by the Proponent were limited to construction activities, therefore there is no temporal overlap between it and the Project. The new effluent treatment facility project and the Highway 104 twinning project will not be considered further in this report.

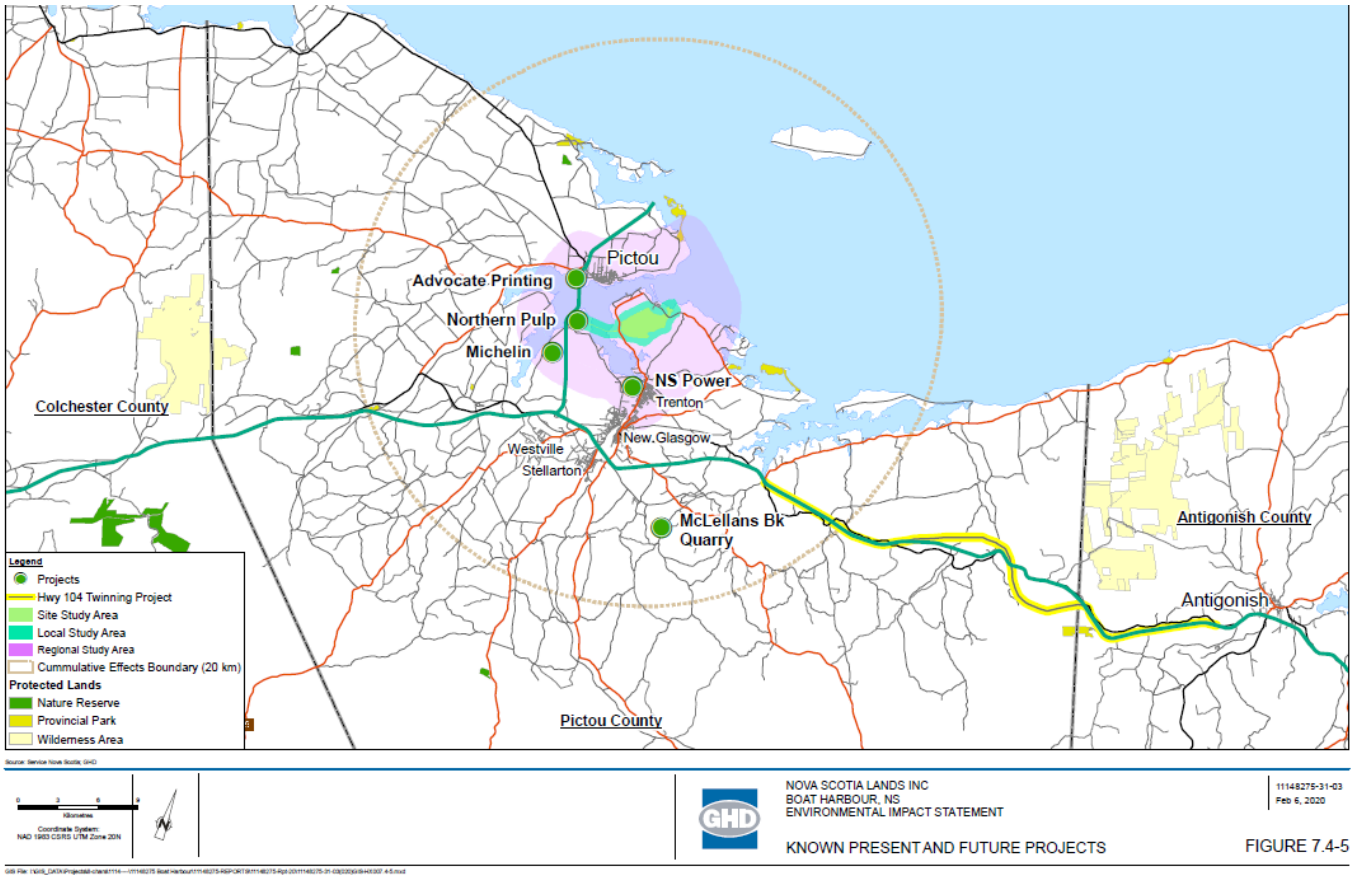
The valued components were chosen based on the geographical extent of the Project's potential residual effects, timing of potential residual effects, level of concern noted during engagement, current state of the valued component, potential for significant cumulative effects, uncertainty in the prediction of cumulative effects, and potential for follow-up programs or additional mitigations.

Table 3: Projects and Physical Activities Included in the Cumulative Effects Assessment

Project or Physical Activity	Years in Operation	Project Type/Activity	Distance from Project (kilometres)	Potential Effects
Michelin Canada's tire manufacturing plant	1971 – Present	Production facility	7.8	Degradation of air quality, noise and light sensory disturbance
Advocate Printing facility	1891 – Present	Production facility	5.9	Degradation of air quality, noise and light sensory disturbance
Nova Scotia Power's Trenton plant	1969 – Present	Electricity generation	4.7	Contamination of marine environment, degradation of air quality, noise and light sensory disturbance.

Source: Adapted from Boat Harbour Remediation Project, Environmental Impact Statement, Section 7.4.3.3.3

Figure 10: Location of Projects and Physical Activities



Description: Projects considered in the Proponent's cumulative effects assessment include those located within a 20-kilometre radius from the SSA.

Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.4-5

Cumulative Effects on Fish and Fish Habitat

The Project's predicted residual effects to fish and fish habitat are described in Section 5.1 (Fish and Fish Habitat) of this report. After applying mitigation measures, the residual effects, in particular those related to release of sediment into the marine environment, could interact cumulatively with other present projects and activities, such as Nova Scotia Power's Trenton plant.

Nova Scotia Power's Trenton plant discharges water used in the operation of the plant into the East River, which would have the potential to affect the marine environment. The Proponent stated that these effects would be localized to the outfall location, and the plant has operating approvals that would specify limits for effluent quality and quantity which would limit or eliminate potential risks to the marine environment. The Proponent predicted that following the implementation of mitigation measures, cumulative effects to both the freshwater and marine environments, as they relate to fish and fish habitat, would not be significant.

Cumulative Effects on PLFN and the Mi'kmaq of Nova Scotia

The Project's predicted residual effects to PLFN and the Mi'kmaq of Nova Scotia are described in sections 5.3 (Health Conditions), 5.4 (Cultural and Physical Heritage), and 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report. These residual effects could interact cumulatively with other present projects and activities. Effects to PLFN and the Mi'kmaq of Nova Scotia could result from cumulative effects on fish and fish habitat (discussed in the section above), as well as effects on air quality and odour, discussed below.

The Proponent predicted that the Project would result in residual effects to air quality and odour, which would potentially result in residual effects on PLFN and the Mi'kmaq of Nova Scotia's use of lands and resources for traditional purposes. The Project's predicted residual effects to PLFN and the Mi'kmaq of Nova Scotia's health, as they relate to air quality and odour, are described in Section 5.3 (Health Conditions) of this report. These residual effects could interact cumulatively with Michelin Canada's tire manufacturing plant, Nova Scotia Power's Trenton plant, and Advocate Printing facility, as each of these projects generate air emissions. However, the Proponent stated that air emissions from these current projects would have been captured in the baseline air monitoring sampling conducted for the Project. Therefore, the Proponent predicted that residual cumulative effects to air quality and odour would not be significant, given the mitigation, follow-up, and monitoring measures proposed.

The Proponent concluded that significant residual adverse cumulative effects on PLFN and the Mi'kmaq of Nova Scotia would not be anticipated because no significant residual cumulative effects were predicted on any of the valued components that could interact with PLFN and the Mi'kmaq of Nova Scotia. The Proponent stated that no additional follow-up programs or mitigation measures would be required.

6.3.2 IAAC Analysis and Conclusions

IAAC is of the view that the Proponent adequately identified past, present, and future projects that could potentially interact with the Project. IAAC is of the view that, after taking into consideration the effects of the Project and its interactions with the effects of these projects and activities, the Project is not likely to cause significant adverse cumulative environmental effects.

Fish and Fish Habitat

IAAC recognizes that there could be interacting project effects with other present projects related to the marine environment, which would potentially affect fish and fish habitat within the marine LSA. However, IAAC is of the view that due to distance from potential interacting projects and regulatory protective measures currently in place for Nova Scotia Power's Trenton plant, cumulative effects to fish and fish habitat would not be expected. Furthermore, the Proponent's proposed mitigation measures, monitoring, and follow-up programs and the key mitigation, monitoring, and follow-up measures identified in Section 5.1 (Fish and Fish Habitat) of this report will adequately minimize the Project's contributions to fish and fish habitat, reducing the potential for cumulative effects.

PLFN and the Mi'kmaq of Nova Scotia

IAAC agrees with the Proponent's conclusion that there would be no significant residual cumulative effects on individual valued components with the potential to adversely affect PLFN and the Mi'kmaq of

Nova Scotia. However, IAAC notes that the absence of significant residual cumulative effects on those valued components is not sufficient rationale to conclude that there will not be significant residual cumulative effects on PLFN and the Mi'kmaq of Nova Scotia.

IAAC agrees that impacts to air quality from the Project could adversely affect PLFN and the Mi'kmaq of Nova Scotia, and these air quality effects could interact cumulatively with Michelin Canada's tire manufacturing plant, Nova Scotia Power's Trenton plant, and Advocate Printing facility, as each of these projects generate air emissions. IAAC is of the view that potential effects to air quality due to these current projects, and their potential impacts to PLFN and the Mi'kmaq of Nova Scotia, have been considered within the baseline conditions of the Project and in Section 5.3 (Health Conditions) of this report.

IAAC acknowledges that although the former pulp mill, Boat Harbour effluent treatment facility, and the former Canso Chemicals Ltd. chlor-alkali plant were not assessed by the Proponent for cumulative effects, these projects are closely related to the Project as they contributed to the current contamination of the SSA. IAAC is of the view that complex historical factors and environmental effects associated with these past projects have adversely impacted PLFN and the Mi'kmaq of Nova Scotia, and these effects continue today. However, effects to PLFN and the Mi'kmaq of Nova Scotia due to these past projects have been considered within the baseline conditions of the Project, and are discussed further in Sections 5.3 (Health Conditions), 5.4 (Physical and Cultural Heritage), and 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report.

Key Mitigation Measures and Monitoring to Avoid Significant Effects and Follow-Up Program Requirements for Cumulative Effects

IAAC considers the key mitigation, monitoring, and follow-up measures discussed in this report to be appropriate to account for potential cumulative adverse environmental effects associated with the Project on fish and fish habitat (Section 5.1), migratory birds (Section 5.2), and health conditions (Section 5.3), physical and cultural heritage (Section 5.4), and current use of lands and resources for traditional purposes (Section 5.5).

7 Impacts on Aboriginal and Treaty Rights

The Government of Canada has a legal duty to consult and, where appropriate, accommodate Indigenous peoples, when the Crown contemplates conduct that may adversely affect Aboriginal and treaty rights that are recognized and affirmed in section 35 of the *Constitution Act, 1982* (section 35 rights). During the EA process on the Project, IAAC upheld this duty and undertook steps that demonstrated its commitment to advancing reconciliation with Indigenous peoples, based on a recognition of rights, respect, cooperation, and partnership. IAAC's work was guided by the *Principles respecting the Government of Canada's Relationship with Indigenous peoples,* and the government of Canada's commitment to implement the *United Nations Declaration on the Rights of Indigenous Peoples Act.* IAAC's aim was, to the extent possible, to secure free, prior, and informed consent.

IAAC considered information from the Proponent and PLFN (on behalf of the Mi'kmaq of Nova Scotia) about the potential impacts of the Project to understand the nature, scope, and extent of adverse impacts on section 35 rights. IAAC identified that the Project has the potential to impact PLFN and the Mi'kmaq of Nova Scotia's section 35 rights and considered appropriate mitigation measures before determining the severity of the potential impacts.

This chapter summarizes how the Project may potentially impact the section 35 rights of PLFN and the Mi'kmaq of Nova Scotia. Issues raised throughout the EA by PLFN, on behalf of the Mi'kmaq of Nova Scotia, are summarized in the Sections 7.1, 7.2, and 7.3 of this report.

7.1 Existing Aboriginal and Treaty Rights

The Project is located within Mi'kma'ki',[36] more specifically, the district of Epekwitk aq Piktuk, the traditional territory of the Piktukowaq (person from the traditional territory of Piktuk). The Mi'kmaq of Nova Scotia claim all of Nova Scotia, including the RSA, as their traditional territory. The Mi'kmaq of Nova Scotia's Aboriginal rights include hunting and fishing, as well as other uses of the lands and resources including plant harvesting and cultural practices, within Nova Scotia, including the RSA for this Project.

The Mi'kmaq of Nova Scotia are a signatory to the Peace and Friendship Treaties, signed between 1725 and 1779 between Mi'kmaq and British settlers, the terms of which were intended to help establish peace and commercial relations. The courts, including the Supreme Court of Canada decisions in *R. v. Marshall* [37], confirmed the treaty rights of the Mi'kmaq of Nova Scotia to hunt, fish and gather, in pursuit of a "moderate livelihood". All the Nova Scotia Mi'kmaq communities hold food, social and ceremonial (FSC)

[36] Mi'kma'ki is the ancestral and unceded territory of the Mi'kmaq and encompasses Nova Scotia, Prince Edward Island, and parts of New Brunswick, Gaspe Peninsula of Quebec, the island of Newfoundland. Nova Scotia encompasses the Mi'kma'ki districts of Kespukwitk, Sipekne'katik, Eskikewa'kik, Unama'kik, and Epekwitk aq Piktuk.

[37] R. v. Marshall. Available at: https://decisions.scc-csc.ca/scc-csc/scc-csc/en/item/1739/index.do

and commercial communal fishing licences to harvest a variety of marine and freshwater species in tidal and non-tidal waters of Nova Scotia.

Furthermore, the Mi'kmaq of Nova Scotia assert Aboriginal title to all the lands and waters of Nova Scotia, including the offshore. Specifically, PLFN assert Aboriginal title to the lands surrounding Boat Harbour, including the lands on which the containment cell is located.

The Governments of Canada and Nova Scotia continue to work with the Mi'kmaq of Nova Scotia to negotiate outstanding Treaty, title, and Aboriginal rights questions in Nova Scotia. A Made-in-Nova Scotia Process was established as a rights-based process to ensure that the interests of Indigenous groups in land, resource management, and environmental protection are realized and that claimants share in the benefits of development. On February 23, 2007, a framework agreement was signed between the Mi'kmaq of Nova Scotia, the Province of Nova Scotia, and the Government of Canada to set out the process to promote negotiations toward a resolution of issues respecting Mi'kmaq rights and title. Further, a Consultation Terms of Reference was signed in 2010 which committed the Mi'kmaq,[38] the province of Nova Scotia and the Government of Canada to a process for discharging the duty to consult and accommodate on decisions regarding natural resources which have the potential to adversely affect the Aboriginal or treaty rights of the Mi'kmaq of Nova Scotia.

7.2 Potential Adverse Impacts of the Project on Section 35 Rights

IAAC considered the effects of changes to the environment on the health conditions, physical and cultural heritage, and current use of lands and resources for traditional purposes, which would impact the exercise of PLFN and the Mi'kmaq of Nova Scotia's section 35 rights.

The Proponent acknowledged that the operation of the effluent treatment facility has limited PLFN's ability to exercise their rights and impacted their cultural and spiritual relationship with the waters and lands of A'se'k. The Proponent stated that because the Project's objective is to return Boat Harbour and any impacted surrounding lands to a tidal estuary according to the desires of PLFN, impacts to the restoration of Aboriginal and treaty rights during and post-remediation are generally positive. As such, the Proponent summarized that the outcome of the Project would accommodate PLFN in exercising their Aboriginal and treaty rights in and around A'se'k, specifically in terms of improved health and socio-economic conditions.

PLFN stated that returning A'se'k and the surrounding area back to its original state, as it was prior to the operation of the effluent treatment facility, is critical for the health and psychological well-being of PLFN.

[38] Initially included all 13 Mi'kmaq First Nations in Nova Scotia, the members of the Assembly of Mi'kmaq First Nations through the administrative body Kwilmu'kw Maw-Klusuaqn Negotiation Office (KMKNO). Currently, Membertou, Millbrook and Sipekne'katik First Nations are consulted independently and are not represented by KMKNO.

PLFN stated the existing containment cell "…is an unjustified infringement of PLFN's rights to the use and enjoyment of Indian Reserves 37 and 24G. It has always infringed PLFN's section 35 rights and should not be considered for long term storage of even more hazardous waste".[39]

7.2.1 Fishing Rights

The Project may interact with PLFN and the Mi'kmaq of Nova Scotia's ability to exercise their right to fish traditionally or commercially within Boat Harbour and surrounding watercourses in the SSA, and within the marine RSA. All Mi'kmaq communities in Nova Scotia hold food, social and ceremonial (FSC) and commercial communal fishing licences to harvest a variety of marine and freshwater species in tidal and non-tidal waters of Nova Scotia.

IAAC understands that PLFN continue to exercise their rights to fish within the marine RSA, and hold FSC licences for species of cultural importance (e.g. salmon, eel, trout, and striped bass) in tidal waters of Pictou Harbour and Pictou County, and tidal waters of Gulf of Nova Scotia, within or in close proximity to the marine RSA (e.g., East River, West River, and River John, Merigomish Harbour, and Northumberland Strait).

IAAC understands that before the effluent treatment facility was operational and the containment cell was constructed, PLFN exercised their rights to fish in A'se'k, and historically fished salmon, trout, smelt, bass, and mackerel. Currently, PLFN and the Mi'kmaq of Nova Scotia do not exercise their section 35 rights to fish in Boat Harbour and surrounding freshwater watercourses due to contamination and restriction of access to the SSA.

Pathways of the Impact from the Project on Fishing Rights

IAAC considered the impact of the Project on the availability and quality of fish species for traditional use and the quality of the traditional use experience in the SSA (Boat Harbour and surrounding freshwater wetlands and watercourses), and in the marine RSA (including but not limited to the Northumberland Strait).

IAAC recognizes that PLFN are not currently fishing in Boat Harbour and surrounding freshwater waterbodies due to the contamination from the operation of the effluent treatment facility, and due to the restriction of access to the SSA. The Proponent predicted that once the contamination is removed from the SSA there would be an overall long-term improvement to fish habitat and potential for increased health and quality of fish resources within the SSA. The Proponent predicted that access to the SSA would be restored, allowing PLFN and the Mi'kmaq of Nova Scotia to resume fishing activities. Further, after dam removal, tidal influence will be restored to A'se'k which the Proponent predicted would result in new species inhabiting the SSA and create opportunities for food, social and ceremonial fisheries. PLFN stated that it is unlikely that traditional use activities, including fishing, would resume in the SSA due to the presence of the vertically-expanded containment cell. PLFN expressed that the vertically-expanded containment cell remaining in place would remind the community of the hurt, pain, and suffering

[39] Final Position of PLFN on Proposed Boat Harbour Remediation Project. Available at: https://iaac-aeic.gc.ca/050/evaluations/proj/80164/contributions/id/61897

experienced due to the history of Boat Harbour, impacting the ability and desire of PLFN to practice their Aboriginal and treaty rights in the SSA.

PLFN raised concerns about the impact of the Project on their FSC and commercial fisheries in the marine RSA due to potential impacts to the health and quality of fish and marine species, including species at risk. Potential impacts to FSC and commercial fisheries in relation to fish and fish habitat, including mitigation and follow-up measures, are discussed in Section 5.1 (Fish and Fish Habitat) of this report.

Assessment of the Impact on Fishing Rights

IAAC acknowledges that the operation of the effluent treatment facility led to the contamination of A'se'k and surrounding waters, resulting in changes to the availability, quality, and health of fish and fish habitat, and the restriction of access to the SSA by PLFN and the Mi'kmaq of Nova Scotia. Although IAAC is of the view that remediation activities (including dredging of Boat Harbour and removal of wetlands) would result in adverse impacts to fish and fish habitat; in the long-term, after remediation is complete, the Project would result in an overall improvement to fish and fish habitat and would likely result in the reestablishment of access to the SSA (excluding the containment cell area) by PLFN and the Mi'kmaq of Nova Scotia.

IAAC is of the view that after remediation it is unlikely that PLFN would resume traditional activities, including fishing, in and around A'se'k if the vertically-expanded containment cell and the risks (actual and perceived) associated with the storage of hazardous waste, remained permanently in place, as discussed in Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report. The Proponent will be required to reconstruct the containment cell in a manner such that the waste can be removed and the containment cell can be decommissioned. An Advisory Committee co-led by the Proponent and PLFN will be established to seek out and assess potential alternative locations for the waste. If a suitable alternative location for the waste is identified, the Proponent will be required submit changes to the Project to IAAC, including decommissioning of the vertically-expanded containment cell and moving the waste to the alternative location. The Proponent will be required to carry out these activities subject to any regulatory approvals, permits, or appropriations. IAAC is of the view that these requirements will reduce the likelihood of the containment cell remaining in the SSA permanently, therefore PLFN will likely be able utilize A'se'k to exercise their right to fish for a moderate livelihood in the future.

IAAC notes the importance of the implementation of the proposed mitigation, follow-up, and monitoring measures identified in this report. The key mitigation measures discussed in Sections 5.1 (Fish and Fish Habitat), 5.5 (Current Use of Lands and Resources for Traditional Purposes), and 5.3 (Health Conditions) of this report support PLFN and the Mi'kmaq of Nova Scotia's continued ability to practice fishing rights commercially and for FSC purposes.

7.2.2 Hunting, Trapping and Gathering Rights

The Project may interact with PLFN and the Mi'kmaq of Nova Scotia's ability to exercise their rights related to hunting, trapping and gathering within the SSA. IAAC understands that before the effluent treatment facility was operational and the containment cell was constructed, PLFN exercised their rights within the RSA, and historically, the Mi'kmaq of Nova Scotia frequently hunted deer, rabbit, and partridge;

and gathered berries, hazelnuts, sweetgrass, golden thread, and lion's paw for food and/or medicinal purposes. However, due to the contamination and restricted access to the SSA, PLFN and the Mi'kmaq of Nova Scotia do not currently exercise their section 35 rights to hunt, trap and gather, within the vicinity of Boat Harbour; and therefore, travel outside the RSA to practice their rights.

Pathways of the Impact from the Project on Hunting, Trapping and Gathering Rights

IAAC considered the impacts of the Project to the quality and availability of resources for traditional use known to be historically harvested by the Mi'kmaq of Nova Scotia in the RSA. IAAC recognizes that PLFN are not currently hunting or trapping within the SSA for subsistence, nor gathering plants and medicines, due to the contamination from the operation of the effluent treatment facility, and restriction of access to the SSA; and therefore, travel further afield, outside of the RSA to harvest resources for traditional purposes. The Proponent is of the view that the Project would result in positive changes to the ecosystem, and in the long-term may encourage the Mi'kmaq of Nova Scotia to resume traditional hunting, trapping, and gathering activities of returning and new species.

The Proponent is of the view that the removal of contamination from the SSA would facilitate the healing of A'se'k, increase the availability of lands and improve the quality and health of resources historically used for traditional purposes. The Proponent stated that this would restore PLFN's ability to exercise their section 35 rights to fish, hunt, trap, and gather in the SSA, should they so choose.

IAAC also considered the changes in access to lands and resources, and frequency of traditional use and quality of experience. During remediation activities, including the removal of the contaminated wetlands, access to areas of the SSA will continue to be restricted. Post-remediation, the Proponent stated that the lands within the SSA, excluding the containment cell area, would become accessible for recreation and traditional use. Although the Proponent acknowledged that the area containing the containment cell would continue to restrict PLFN's ability to exercise their section 35 rights within the SSA, the Proponent is of the view that the measures proposed would mitigate and accommodate these impacts to PLFN.

The Proponent highlighted that PLFN were involved in several aspects of the project design which serve as mitigations for impacts to Aboriginal and treaty rights resulting from the Project. As requested by PLFN, the causeway would be replaced by a new bridge which would incorporate clearance for pleasure craft, small fishing boats, and vehicles. Additionally, funding would be provided to construct a boat slipway and wharf post-remediation. Access road upgrades or construction would have potentially restricted access of canoes and kayaks to portions of the wetlands, therefore the Proponent incorporated the construction of a small span bridge to allow passage. The Proponent explained that the conduct of the HHERA, including the funding of a third-party review on behalf of PLFN, was intended to accommodate PLFN's concerns about any potential impact to habitats that would be relevant to PLFN exercising their Aboriginal and treaty rights. The Proponent also proposed that any destruction of wetland habitat will be subject to compensation through enhancement of existing wetlands on-site and/or creation of new wetlands at least equal in size in another area near Boat Harbour to mitigate the effects of the remediation. As discussed in Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report, the Proponent committed to the transfer of up to 173 hectares of provincially-owned lands to PLFN after the Project is completed to provide some accommodation for the limitations on land use associated with the containment cell that could impact the Aboriginal and treaty rights of PLFN. PLFN expressed the land transfer is not an adequate accommodation measure to mitigate the impacts to the

loss of lands for traditional use and PLFN's ability to exercise their Aboriginal and treaty rights within the SSA, as the Province of Nova Scotia already committed to transfer lands to PLFN outside of the EA process.

PLFN stated that it is unlikely traditional use activities would resume on these lands if the vertically-expanded containment cell remained in the SSA. PLFN expressed that the vertically-expanded containment cell remaining in place would remind the community of the hurt, pain, and suffering experienced due to the history of Boat Harbour, impacting the ability and desire of PLFN to practice their Aboriginal and treaty rights in the SSA. Impacts of the vertically-expanded containment cell on PLFN's traditional use activities, including PLFN's views, are discussed in Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report.

Assessment of the Impact on Hunting, Trapping and Gathering Rights

IAAC acknowledges that the operation of the effluent treatment facility led to the contamination of A'se'k and surrounding lands and watercourses; and that the establishment of the containment cell has resulted in restricted access to lands and resources. This has decreased opportunities for PLFN to hunt and trap for subsistence and a moderate livelihood, and to gather plants and medicines for traditional purposes.

IAAC acknowledges that access to areas of the SSA is currently restricted due to the presence of contamination, and therefore the SSA is not currently being used for hunting, trapping, or gathering activities. During site preparation and remediation activities, access to lands and resources within the SSA will continue to be physically restricted; however, the Proponent predicted that post-remediation the lands within the SSA, excluding the containment cell area, would be accessible for hunting, trapping, and gathering. The land where the vertically-expanded containment cell is located would be inaccessible for traditional use.

PLFN perceives the vertically-expanded containment cell as a limitation to the restoration of PLFN's traditional land and resource use and the exercise of their section 35 rights. As noted in Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) of this report, IAAC is of the view that PLFN is unlikely to restart traditional use of the area, including hunting, trapping, and gathering activities, while the vertically-expanded containment cell is present in the SSA due to the risks (actual and perceived) associated with the storage of hazardous waste. IAAC is of the view that the Project will likely result in a long term improvement to the SSA, including traditional resources, allowing PLFN to resume traditional activities. However, PLFN is unlikely to resume practice of their hunting, trapping, and gathering rights within the SSA until the waste is removed from the SSA, and the vertically-expanded containment cell is decommissioned. IAAC is of the view that conditions ensuring the containment cell is reconstructed in a manner such that the waste can be removed, and requiring the Proponent to establish an Advisory Committee to seek out and assess potential alternative locations for the waste, the likelihood of the containment cell remaining in the SSA permanently is minimized. Therefore, IAAC is of the view that PLFN would likely be able utilize A'se'k to exercise their right to hunt, trap, and gather for a moderate livelihood in the future.

IAAC notes the importance of the implementation of the mitigation, follow-up, and monitoring measures identified in this report. Key mitigation measures described in Section 5.2 (Migratory Birds) and Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) are important to support PLFN and the Mi'kmaq of Nova Scotia's continued ability to practice hunting, trapping and gathering rights.

7.2.3 Cultural Continuity

The Project may interact with PLFN and the Mi'kmaq of Nova Scotia's ability to practice cultural continuity. Section 35 rights include a range of cultural, social, political, and economic rights. PLFN and the Mi'kmaq of Nova Scotia describe their right to a way of life in respect of cultural continuity, the opportunity to derive a moderate livelihood from rights-based activities and practices, and to be the caretakers of lands, waters and resources within their territory, including A'se'k[40].

IAAC understands that cultural continuity and the ability to practice their Mi'kmaq way of life is of great importance to PLFN and the Mi'kmaq of Nova Scotia. Cultural and spiritual practice is essential to their relationship and connection to A'se'k and to their Mi'kmaq identity and cultural survival. Cultural and spiritual connections to A'se'k creates a sense of place and is critical to mental and community well-being.

Pathways of the Impact of the Project on Cultural Continuity

IAAC considered that the Project will continue to restrict PLFN's access to traditional use areas within the SSA and prevent PLFN from utilizing A'se'k and surrounding lands for cultural and spiritual practices which would result in continued impacts on PLFN's quality of experience, and cultural continuity. IAAC recognizes that PLFN are not currently utilizing the SSA for cultural and spiritual practices due to the contamination that resulted from the operation of the effluent treatment facility, and restriction of access to the SSA.

The Proponent acknowledged due to the establishment and operation of the effluent treatment facility and the containment cell, the interconnectedness of cultural practices with the biophysical environment and the loss of PLFN's relationship with A'se'k has resulted in the disruption to the Mi'kmaq way of life, and the transfer of Mi'kmaq knowledge between generations (as described in Section 5.4 of this report, Physical and Cultural Heritage). The Proponent states that overall, the Project would result in positive changes to the ecosystem currently impacted by the contamination, and would restore access to the SSA, excluding the containment cell area, allowing activities their community enjoyed prior to the industrialization of the SSA, should they so choose. The Proponent predicts that there is the potential to return A'se'k and the adjacent watercourses and lands to a state that encourages cultural, agricultural and ceremonial use. The Proponent acknowledged that PLFN raised objections to the storage of waste within the SSA, and the presence of the vertically-expanded containment cell would not allow A'se'k and the community to heal psychologically and spiritually.

Due to the contamination of A'se'k and surrounding lands, PLFN have expressed that they have been unable to transfer knowledge to younger generations, as described by a member of PLFN in the PLFN Well-being Baseline Study:

> ***When you talk about the harm and our traditional Mi'kmaw ways… [w]e don't even know what it is. Because we haven't been able to practice it. So, that's the***

[40] When the PLFN community refers to A'se'k they are referring to the past, what A'se'k once was. When they refer to Boat Harbour, they are referring to the Boat Harbour effluent treatment facility, or what A'se'k has become.

> ***most harmful part of when I look at that question about your ceremonies and traditional Mi'kmaw spirituality, our generation doesn't know what it looks like. Because we haven't been able to practice it all these years.***

PLFN outlined that the permanence and vertical expansion of the containment cell would have an ongoing impact on their connection to A'se'k. PLFN indicated the following in the PLFN Well-being Baseline Study:

> ***they "can no longer be caretakers of the environment, there is no knowledge transfer, the relationship with Kisu'lk [the Creator] is broken due to the loss of the ceremonial and sacred space at A'se'k."***

PLFN stated that the Project will have a significant impact on PLFN's Aboriginal and treaty rights and will continue the legacy of psychological and cultural harm to PLFN members. PLFN's views about the storage of hazardous waste and the presence of the vertically-expanded containment cell in the SSA are further discussed in Section 5.5 (Current Use of Lands and Resources for Traditional Purposes) and the impact of the Project on cultural heritage and A'se'k are discussed in Section 5.4 (Physical and Cultural Heritage) of this report.

Assessment of the Impact on Cultural Continuity

IAAC acknowledges that the operation of the effluent treatment facility contributed to the contamination of A'se'k and surrounding waters, resulting in the restriction of access to the SSA by PLFN and the Mi'kmaq of Nova Scotia. This has impacted PLFN and the Mi'kmaq of Nova Scotia's ability to practice their Mi'kmaq way of life. IAAC agrees with the Proponent that the Project would restore PLFN's physical access to the lands and resources in the SSA for future cultural and spiritual practices, with the exception of the land occupied by the containment cell, which would be lost due to the ongoing use and vertical expansion of the containment cell. IAAC is of the view that if the vertically-expanded containment cell remains, PLFN are unlikely to resume use of the SSA after remediation, including for spiritual and cultural activities. Its permanent presence would continue to negatively affect PLFN's quality of experience within the SSA and restoration of traditional use activities in A'se'k, resulting in the loss of their connection to A'se'k and impeding their Mi'kmaq way of life within the SSA.

IAAC is of the view that with conditions ensuring the containment cell is reconstructed in a manner such that the waste can be removed, and requiring the Proponent to establish an Advisory Committee to seek out and assess potential alternative locations for the waste, the likelihood of the containment cell remaining in the SSA permanently is minimized. Therefore, IAAC is o f the view that PLFN would likely be able utilize A'se'k to exercise their right to a Mi'kmaq way of life in the future.

IAAC notes the importance of the implementation of the mitigation, follow-up, and monitoring measures identified in Sections 5.5 (Current Use of Lands and Resources for Traditional Purposes) and 5.4 (Physical and Cultural Heritage) of this report to support PLFN and the Mi'kmaq of Nova Scotia's cultural continuity and the ability to practice their Mi'kmaq way of life within the SSA.

7.3 Issues to be Addressed During the Regulatory Approval Phase

Should the Project proceed, federal authorities with a regulatory role will continue consultation with Indigenous groups after the EA decision is issued. Specifically, relevant federal authorities will consult with PLFN and the Mi'kmaq of Nova Scotia prior to making decisions related to *Fisheries Act* authorizations and *Canadian Navigable Waters Act* approval(s), as appropriate. Comments from PLFN received during the EA will be shared directly with federal authorities to inform their decision-making. As applicable, the decisions by federal authorities would take into account the outcomes of ongoing consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and the consultation record resulting from the EA.

IAAC recognizes that the Project is subject to approvals under provincial legislation and that associated provincial regulations, guidelines, and policies provide for the protection of relevant aspects of both the natural and human environments. Consultation by the province, as applicable, on those authorizations will also create opportunities for PLFN and the Mi'kmaq of Nova Scotia to have their concerns addressed. The provincial Crown has a duty to consult Indigenous groups, as appropriate, prior to making decisions.

7.4 IAAC Conclusions Regarding Impacts to Section 35 Rights

Should the Project proceed, IAAC acknowledges that the Project is likely to cause changes to the exercise of section 35 rights. This includes low severity impacts on the right to hunt, trap, fish, and gather, and low severity impacts on cultural continuity and the ability to practice a Mi'kmaq way of life. IAAC is of the view that, taking into account the mitigation, follow-up, and monitoring measures proposed by the Proponent and the key mitigation measures identified by IAAC in this report, potential impacts of the Project on section 35 rights would be appropriately mitigated. IAAC recognizes that proponent-led discussions with PLFN regarding the Project are ongoing.

8 Conclusions and Recommendations of IAAC

In preparing this report, IAAC considered: the Proponent's EIS, its responses to information requirements and clarification questions, the views of federal authorities, and the views of PLFN on behalf of the Mi'kmaq of Nova Scotia, measures that would be implemented to mitigate project effects, and follow-up and monitoring measures.

The environmental effects of the Project and their significance have been determined using assessment methods and analytical tools that reflect current accepted practices of environmental and socio-economic assessment, including consideration of potential accidents and malfunctions and cumulative environmental effects.

IAAC recognizes that there are potential residual adverse effects to fish and fish habitat; migratory birds; PLFN and the Mi'kmaq of Nova Scotia's health conditions; current use of lands and resources for traditional purposes; physical and cultural heritage, and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. A discussion of these effects can be found in the corresponding chapters of this report.

IAAC concludes that, considering the implementation of mitigation measures, the Project is not likely to cause significant adverse environmental effects, as defined in CEAA 2012. IAAC identified key mitigation measures, monitoring, and follow-up programs, for consideration by the Minister of Environment and Climate Change in establishing conditions as part of the EA Decision Statement, should the Project be permitted to proceed.

In addition, it is IAAC's expectation that, for the Project to be carried out in a precautionary manner, all the Proponent's commitments, including mitigation measures, monitoring, and follow-up programs, as outlined in the EIS and its supporting documents, would be implemented as proposed. Further, it is expected that the Proponent will continue to engage, inform, and communicate with PLFN on behalf of the Mi'kmaq of Nova Scotia throughout the life of the Project, should it be permitted to proceed.

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Appendices

Appendix A: Environmental Effects Rating Criteria

IAAC developed the following evaluation criteria for the analysis of the significance of environmental effects in the context of the EA. Below are the general definitions of the criteria, the definition of levels for extent, duration, frequency, and reversibility (Table A-1), the definition of magnitude levels applicable to each of the valued components (Table A-2), as well as a decision tree used for determining the significance of environmental effects (Table A-3).

General definitions of the criteria used to assess residual effects on each of the valued components are as follows:

Direction: The relative change compared to existing conditions (i.e. positive, adverse, or neutral).

Magnitude: The degree of change in a measurable parameter or variable relative to baseline conditions, defined for each valued component as low, moderate, high, or other qualifier deemed appropriate.

Geographic Extent: The geographic or spatial boundaries within which the residual effect is expected to occur, defined for each valued component based on definitions of the site study area (SSA), local study area (LSA), and regional study area (RSA). Definitions for the spatial boundaries identified for each valued component are presented in Appendix C of this report.

Frequency: How often the residual environmental effect would occur during a project phase or activity in a specified time period.

Duration: The period of time over which the residual effect would occur, defined as short-term, medium-term, and long-term.

Reversibility: Whether the residual effect on the valued component(s) can be returned to its previous condition or other target once the activity or component causing the disturbance ceases.

Timing: Consideration of the periods of time during which a residual effect is expected to occur (e.g., species breeding season, Indigenous spiritual and cultural practices). This criterion is defined as applicable or not applicable.

Significance: The significance of the adverse effect is determined by the combination of the levels assigned to each of the criteria above for each component and using thresholds of significance defined for each valued component.

The **ecological and social context** within which potential environmental effects may occur should be taken into account when considering the key criteria above in relation to a particular valued component, as the context may help better characterize whether adverse effects are significant. For example, information on the context is useful when it reveals a unique characteristic of the area (e.g., proximity to valuable heritage resources) or unique values or customs of a community that influence the perception of an environmental effect (including cultural factors).

Table A-1: Description of Assessment Criteria Ratings for Significance

Assessment Criterion	Rating Descriptions
Magnitude	Refer to Table A-2 for magnitude definitions specific to each valued component.
Geographic Extent	**Site Study Area:** Effects that occur within the site study area. **Local Study Area:** Effects that occur within the local study area. **Regional Study Area:** Effects that occur within the regional study area.
Duration	**Short-term:** Effects that occur within the site preparation and construction phase or effects that occur over a period of less than two years. **Medium-term:** Effects that occur through the site preparation and construction, and operation (i.e., remediation) phases or effects that occur over a period of two to five years. **Long-term:** Effects that extend into closure and post-closure phase and beyond or effects that occur over a period of more than five years.
Frequency	**Once:** Occurs once during any phase of the Project. **Intermittent:** Occurs occasionally or at intermittent intervals during one or more phases of the Project. **Continuous:** Occurs continuously during one or more phases of the Project.
Reversibility	**Reversible:** The valued component will recover completely from the Project's effects (e.g., return to the baseline or another target). **Partially reversible:** The valued component will partially recover from the Project's effects. **Irreversible:** The valued component will not recover from the Project's effects.
Timing[41]	**Applicable:** Timing of the project activities may affect sensitive activities. **Not applicable:** Timing of the project activities are not expected to affect sensitive activities.

Table Description: Definitions of assessment criteria used to assess residual effects on each valued component.

[41] Timing is a valued component-specific consideration, applied to fish and fish habitat, migratory birds, and the Mi'kmaq of Nova Scotia, where disturbance may occur during sensitive life stages.

Table A-2: Descriptions of Magnitude Ratings

Valued Component	Low	Moderate	High
Fish and fish habitat, including aquatic species at risk	A measurable effect on fish health or fish habitat in the receiving environment within the range of natural variability.	Measurable effect on fish health or fish habitat quantity or quality but would not likely result in changes to the regional status of fish health and populations	Measurable effect on fish health or fish habitat quantity or quality, which could result in changes to the regional status of fish health and populations.
Migratory birds, including terrestrial species at risk	A measurable effect on migratory birds or habitats within the range of natural variability.	Measurable effect to migratory birds or migratory bird habitats but would not likely change the status of the regional populations.	Measurable effects on the majority of migratory birds or critical migratory bird habitats which would result in changes to the stratus of regional populations or availability of critical habitats.
Mi'kmaq of Nova Scotia: Health Conditions	Physical Health: Potential physical health effects related to exposure to contaminant levels that are well below the applicable standards and criteria for the protection of physical health; or potential physical health effects are related to exposure to low levels of nuisance (e.g., noise, light, odours, dust). The effects can be felt by a few individuals. Mental Health: Potential mental health effects related to	Physical Health: Potential physical health effects related to exposure to contaminant levels that are below the applicable standards and criteria for the protection of physical health, but at moderate levels of nuisance (e.g., noise, light, vibration, odour, dust). The effects may be felt by certain social groups (e.g., Elders, women, children, fishers). Mental Health: Potential mental health effects related to environmental changes would lead to moderate levels of anxiety, distress, or emotional responses. The effects may be felt by certain individuals or social groups, potentially resulting in	Physical Health: Potential physical health effects related to exposure to contaminant levels that are above applicable standards and criteria for the protection of physical health or to high levels of nuisance (noise, light, vibration, odour, dust). The effects may be felt by several social groups or a significant portion of the affected population. Mental Health: Potential mental health effects related to environmental changes would lead to high levels of anxiety, distress, or emotional responses. The effects may be felt by several social groups or a significant portion of the affected

Valued Component	Low	Moderate	High
	environmental changes would be minor, causing some concern or discomfort without significantly affecting the overall well-being of individuals or groups.	altered patterns of use or engagement within the area affected by the Project.	population, potentially resulting in the complete avoidance of the area affected by the Project.
Mi'kmaq of Nova Scotia: physical and cultural heritage and structures, sites, and things of historical, archaeological, palaeontological, or architectural significance of the Mi'kmaq of Nova Scotia	The effect would slightly alter the characteristics of the unique nature of an element of the physical or cultural heritage and/or of a structure, site or thing of historical, archeological, paleontological or architectural significance; or access to or use of an element of the physical or cultural heritage and/or of a structure, site or thing of importance would not be altered for users.	The effect would alter some characteristics of the unique nature of an element of the physical or cultural heritage and/or of a structure, site or thing of historical, archeological, paleontological or architectural significance, but would not compromise its integrity; or access to or use of an element of the physical or cultural heritage and/or of a structure, site or thing would be altered but would not be compromised for users.	The effect would lead to the loss of characteristics of the unique nature of an element of the physical or cultural heritage or of a structure, site or thing of historical, archeological, paleontological or architectural significance, such that its integrity would be compromised; or the effect would prevent users from accessing or using an element of the physical or cultural heritage or a structure, site or thing of historical, archeological, paleontological or architectural significance.
Current use of lands and resources for traditional purposes by the Mi'kmaq of Nova Scotia	The effect results in a change in an activity or use by an Indigenous community, but this practice could continue in a similar manner as before.	The effect results in a change to the preferred locations or means to practice an activity or use by an Indigenous community such that it may be modified or limited.	The effect results in a change such that an activity or use can no longer be carried out by an Indigenous community in its preferred locations or manner.

Table Description: Descriptions of low, moderate, or high magnitude ratings for each valued component.

Table A-3: Decision Tree for Determining Overall Significance of a Residual Effect

Magnitude[42]	Geographic Extent	Duration	Frequency	Reversibility	Significance
Moderate	Site study area	Short-term or medium-term	Once or Intermittent	Any Level of Reversibility	Not Significant
			Continuous	Fully or Partially Reversible	Not Significant
				Irreversible	Not Significant
		Long-term	Any Level of Frequency	Fully or Partially Reversible	Not Significant
				Irreversible	**Significant**
	Local study area	Short-term	Once or Intermittent	Any Level of Reversibility	Not Significant
			Continuous	Fully or Partially Reversible	Not Significant
				Irreversible	**Significant**
		Medium-term or long-term	Once	Any Level of Reversibility	Not Significant
			Intermittent or Continuous	Fully or Partially Reversible	Not Significant
				Irreversible	**Significant**
	Regional study area	Short-term	Once or Intermittent	Any Level of Reversibility	Not Significant
			Continuous	Any Level of Reversibility	**Significant**
		Medium-term	Once	Any Level of Reversibility	Not Significant
			Intermittent or Continuous	Any Level of Reversibility	**Significant**
		Long-term	Any Level of Frequency	Any Level of Reversibility	**Significant**
High	Site study area	Short-term or medium-term	Any Level of Frequency	Any Level of Reversibility	Not Significant
		Long-term	Any Level of Frequency	Fully or Partially Reversible	Not Significant
				Irreversible	**Significant**

[42] All effects determined to be of low magnitude are considered not significant, regardless of other criteria.

Magnitude[42]	Geographic Extent	Duration	Frequency	Reversibility	Significance
	Local study area	Any Duration	Any Level of Frequency	Fully or Partially Reversible	Not Significant
				Irreversible	**Significant**
	Regional study area	Any Duration	Any Level of Frequency	Any Level of Reversibility	**Significant**

Table Description: Decision tree used to determine overall significance of a residual effect.

Appendix B: IAAC Rationale for Selection of Valued Components and Corresponding Valued Components Selected by the Proponent

Valued Component	Report Section	IAAC Rationale for Inclusion in the Report	Corresponding valued component(s) selected by the Proponent
Effects identified under subsection 5(1) of CEAA 2012			
Fish and Fish Habitat (a)(i) and aquatic species as defined in section 2(1) of SARA (a)(ii)	Fish and Fish Habitat (Section 5.1)	Included due to the ecological importance and legislated protection of fish and fish habitat, as well as associated species at risk, and the socio-economic importance of fisheries resources. In both freshwater and marine environments, fish mortality and injury, project effects to water quality, and habitat disturbance and loss may affect fish and fish habitat. Marine plants potential impacts to marine plants from the release of sediment into the marine environment due to dam removal.	Fish and Aquatic Habitat, Marine Environment, Wetlands, Surface Water, Groundwater, Species at Risk, Mi'kmaq of Nova Scotia
Migratory Birds (a)(iii)	Migratory Birds (Section 5.2)	Included due to the ecological importance and legislated protection of migratory birds, as well as associated species at risk. The Project has the potential to affect migratory birds through habitat loss, sensory disturbance, and direct injury or mortality.	Migratory Birds, Species at Risk, Wetlands, Terrestrial Habitat and Vegetation
Effects of changes to the environment on federal lands, in another province, or outside Canada (b)(i-iii)	Federal Lands (Section 5.6)	Effects of changes to the environment on federal lands were assessed due to potential changes to air quality, the acoustic environment, groundwater quality, wetlands, and PLFN and the Mi'kmaq of Nova Scotia's health conditions, physical and cultural heritage, and current use of lands and resources for traditional purposes that may extend onto Indian Reserves 24, 24G, and 37 located in the SSA and LSA. Project activities are not anticipated to result in any changes to the environment that would have an effect on another	Wetlands, Fish and Aquatic Habitat, Marine Environment, Wetlands, Groundwater, Human Health, Mi'kmaq of Nova Scotia

Valued Component	Report Section	IAAC Rationale for Inclusion in the Report	Corresponding valued component(s) selected by the Proponent
		province, or outside Canada, and therefore were not discussed in the report.	
Effects of changes to the environment on PLFN and the Mi'kmaq of Nova Scotia - Health and Socio- economic Conditions (c)(i)	PLFN and the Mi'kmaq of Nova Scotia - Health Conditions (Section 5.3)	Changes to the atmospheric, terrestrial, and aquatic environments, and changes to country foods may affect the health conditions of PLFN and the Mi'kmaq of Nova Scotia. Changes to the terrestrial environment, including the presence of the vertically-expanded containment cell, may have effects on the mental health and well-being of PLFN and the Mi'kmaq of Nova Scotia. As these effects are closely related to those identified for physical and cultural heritage and the current use of lands and resources for traditional purposes, these are considered with the Physical and Cultural Heritage and Current Use of Lands and Resources for Traditional Purposes sections.	Human Health, Economic and Social, Mi'kmaq of Nova Scotia, Air Quality and Odour, Light, Noise
	Fish and Fish Habitat (Section 5.1)	Changes to the terrestrial environment, including the presence of the vertically-expanded containment cell, that may have effects on socio-economic conditions of PLFN and the Mi'kmaq of Nova Scotia. As these effects are closely related to those identified for mental health and wellness, these are considered within the Mental Health and Well-being subsection. The Project could also result in effects to fish and fish habitat that may affect the socio-economic conditions of PLFN and the Mi'kmaq of Nova Scotia via Indigenous fisheries. This is discussed within the Fish and Fish Habitat section.	Economic and Social

Valued Component	Report Section	IAAC Rationale for Inclusion in the Report	Corresponding valued component(s) selected by the Proponent
Effects of changes to the environment on PLFN and the Mi'kmaq of Nova Scotia - Physical and Cultural Heritage (c)(ii)	PLFN and the Mi'kmaq of Nova Scotia – Physical and Cultural Heritage (Section 5.4)	Changes to the terrestrial environment, including the dredging of lands, may have effects on physical and cultural heritage of PLFN and the Mi'kmaq of Nova Scotia as the majority of the SSA has moderate to high archaeological potential. Changes to the terrestrial environment, including the presence of the vertically-expanded containment cell, that may have effects on cultural heritage, mental health and well-being, and socio-economic conditions of PLFN and the Mi'kmaq of Nova Scotia.	Archaeological/Cultural Heritage Resources, Mi'kmaq of Nova Scotia
Effects of changes to the environment on PLFN and the Mi'kmaq of Nova Scotia - Current Use of Lands and Resources for Traditional Purposes (c)(iii)	PLFN and the Mi'kmaq of Nova Scotia – Current Use of Lands and Resources for Traditional Purposes (Section 5.5)	Changes to the environment, including the presence and expansion of the containment cell in the SSA may affect the availability and quality (actual or perceived) of wildlife species used by PLFN and the Mi'kmaq of Nova Scotia for fishing, hunting, trapping, gathering, and other cultural purposes, and impact the use of lands and resources due to loss of access, and reduced quality of experience.	Mi'kmaq of Nova Scotia
Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance to PLFN and the Mi'kmaq of Nova Scotia (c)(iv)	PLFN and the Mi'kmaq of Nova Scotia – Physical and Cultural Heritage (Section 5.4)	The majority of the SSA has moderate to high archaeological potential. Project activities including dredging and demolition activities, have the potential to result in the disturbance, destruction, or loss of historical, archaeological, paleontological, or architectural sites or structures. Potential effects on sites of significance were included in IAAC's assessment of effects on PLFN and the Mi'kmaq of Nova Scotia's physical and cultural heritage. As these effects are closely related to those identified for physical and cultural heritage, these are discussed in the Physical and Cultural Heritage section.	Mi'kmaq of Nova Scotia

Valued Component	Report Section	IAAC Rationale for Inclusion in the Report	Corresponding valued component(s) selected by the Proponent
Effects assessed pursuant to subsection 5(2) of CEAA 2012			
Commercial Fisheries	Fish and Fish Habitat (Section 5.1)	Project components such as dredging and dam removal that require federal authorizations under the *Fisheries Act* may result in effects to commercial fisheries. Potential effects on commercial fisheries were included in IAAC's assessment of effects on fish habitat.	Fish and Aquatic Habitat, Economic and Social, Health
Wetlands	Fish and Fish Habitat (Section 5.1) Migratory Birds (Section 5.2)	Project components that would result in temporary or permanent loss or alteration of wetlands, and effects to wetlands may require federal authorizations under the *Fisheries Act* and would be enabled due to federal funding from Housing, Infrastructure, and Communities Canada. Potential effects on wetlands were considered in IAAC's assessment of effects on fish and fish habitat and migratory birds.	Wetlands, Mammals and Wildlife, Fish and Aquatic Habitat, Species at Risk, Mi'kmaq of Nova Scotia
Migratory Bird Habitat	Migratory Birds (Section 5.2)	Federal funding for the Project provided by Housing, Infrastructure, and Communities Canada will allow project components that would cause temporary or permanent loss or alteration of migratory bird habitat to proceed. Potential effects on migratory bird habitat were considered in IAAC's assessment of migratory birds.	Migratory Birds

Valued Component	Report Section	IAAC Rationale for Inclusion in the Report	Corresponding valued component(s) selected by the Proponent
Navigation	PLFN and the Mi'kmaq of Nova Scotia – Current Use of Lands and Resources for Traditional Purposes (Section 5.5)	Project components such as the decommissioning of the causeway and dam, and the construction of the bridge requiring federal authorizations under the *Canadian Navigable Waters Act* may result in effects to navigation. Potential effects on navigation were considered in IAAC's assessment of effects on the current use of lands and resources for traditional purposes.	Mi'kmaq of Nova Scotia
Effects identified pursuant to subsection 79(2) of SARA and subsection 5(2) of CEAA 2012			
Federal Species at Risk	Fish and Fish Habitat (Section 5.1)	The SARA requires consideration of listed species when conducting an EA under CEAA 2012. Potential effects to aquatic species at risk, including those assessed by the COSEWIC as endangered, threatened or of special concern, were included in IAAC's assessment of effects on fish and fish habitat.	Species at Risk, Fish and Aquatic Habitat, Marine Environment, Wetlands, Surface Water
	Migratory Birds (Section 5.2)	Potential effects to migratory bird species at risk, including those assessed by the COSEWIC as endangered, threated, or of special concern, were included in IAAC's assessment of effects on migratory birds.	Species at Risk, Migratory Birds, Terrestrial Habitat and Vegetation

Appendix C: Spatial Boundaries

Spatial boundaries of an EA define the area within which a project may interact with the environment and cause effects. The Proponent defined three types of spatial boundaries for the Environmental Assessment: the site study area (SSA), local study area (LSA), and regional study area (RSA). The SSA for each valued component, excluding the marine environment, was defined as:

- Site study area: The SSA is the anticipated area of direct physical disturbance associated with all phases of the Project. The SSA is generally defined by the Proponent as the area spanning from the effluent pipeline from the first standpipe on the pulp mill property, below the East River, through existing and historical Boat Harbour lands, Boat Harbour and its banks, extending to Northumberland Strait.

The SSA for the marine environment includes the estuary and Northumberland Strait shoreline immediately outside the mouth of the estuary, and the portion of the East River containing the effluent pipeline.

The LSA and RSA for each valued component varies, depending on the nature of the Project's interaction with the environment. The following definitions were provided by the Proponent, and apply to most valued components:

- Local study area: The LSA includes the SSA and the geographic extent of effects on the given valued component and is generally defined as all lands and water within 500 metres of the SSA.
- Regional study area: The RSA is valued component-specific and encompasses both the SSA and the LSA. The RSA is generally defined as all lands and water within approximately two and five kilometres of the SSA.

Figure C-1 shows the SSA boundary that was used for all valued components (excluding the marine environment), as well as the general LSA and RSA boundaries that apply to most of the valued components. Figure C-2 shows the spatial boundaries defined for the marine environment.

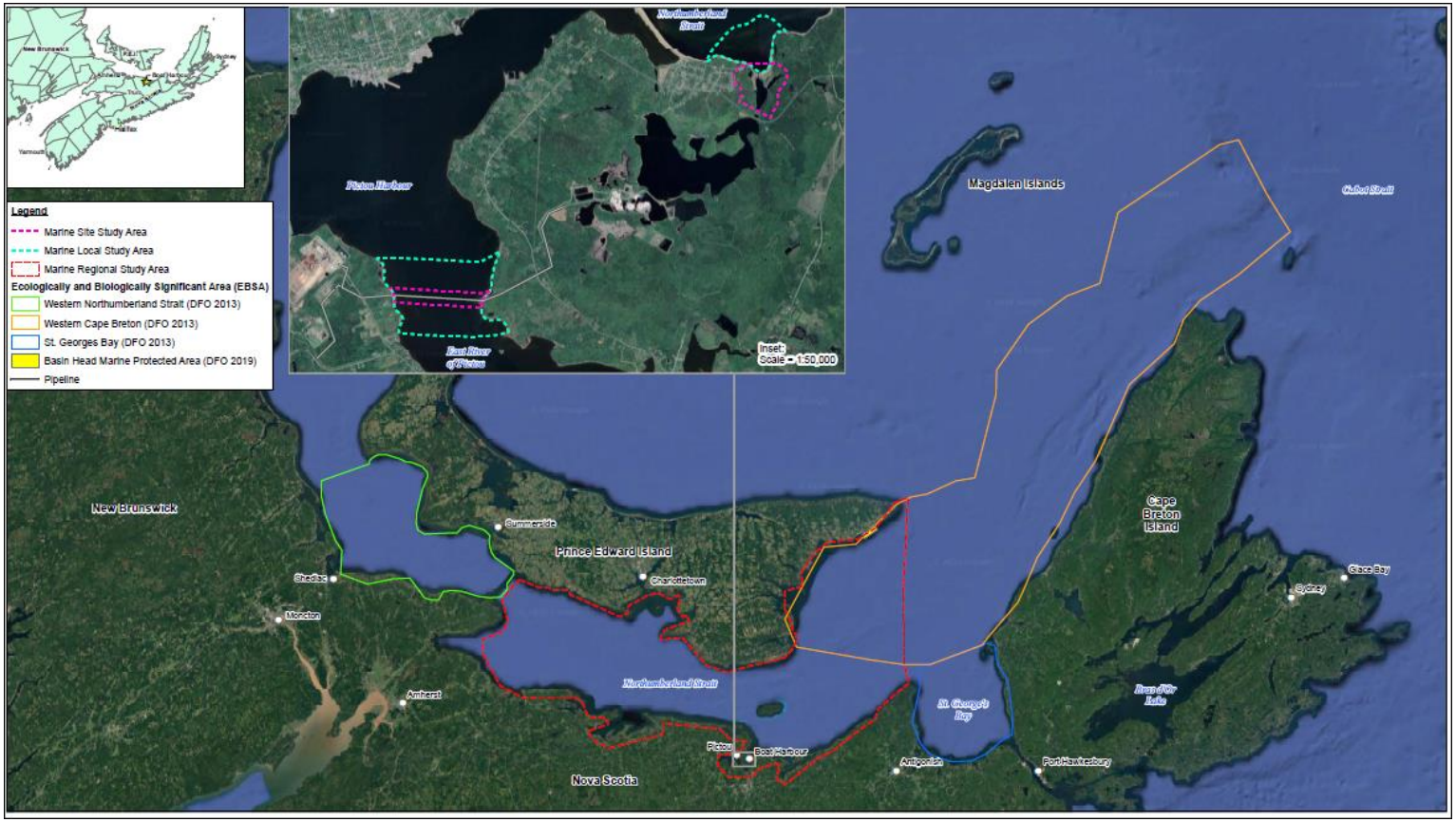
Table C-1 lists the local and regional study area definitions for all valued components assessed in the EIS.

Figure C-1: Proponent's General Spatial Boundaries for Valued Components

Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.1-1.

Figure Description: The SSA encompasses the effluent treatment facility, as well as the area containing the pipeline spanning from the pulp mill to the effluent treatment facility. The LSA for most valued components encompasses the SSA and all lands and waters 500 metres from the SSA. The RSA for most valued components encompasses the SSA, LSA, and all lands and waters two to five kilometres from the SSA, depending on the valued component.

Figure C-2: Proponent's Spatial Boundaries for the Marine Environment



Source: Boat Harbour Remediation Project, Environmental Impact Statement, Figure 7.1-33.

Figure Description: The SSA encompasses the saltwater portions of the SSA defined for most valued components, as well as the Northumberland Strait shoreline immediately outside the mouth of the estuary. The LSA encompasses the Northumberland Strait waters within 500 metres of the Pictou Road Shoreline and waters within 500 metres of the underwater pipeline in the East River. The RSA is the portion of the Northumberland Strait from the east side of the Confederation Bridge to the eastern coast of the Prince Edward Island.

Table C-1: Local and Regional Study Area Descriptions

Component assessed by Proponent	Local Study Area	Regional Study Area
Air Quality	All lands and waters within 500 metres of the SSA.	All lands and waters within three to five kilometres of the SSA.
Fish and aquatic habitat	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Groundwater	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Geology, Geochemistry and Soil	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Light	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Marine Environment (see Figure C-2)	Northumberland Strait waters within 500 metres of the Pictou Road Shoreline and waters within 500 metres of the underwater pipeline in the East River.	The portion of the Northumberland Strait, from the east side of the Confederation Bridge to the eastern coast of the Prince Edward Island.
Mi'kmaq of Nova Scotia – current use of lands and resources for traditional purposes by Indigenous peoples	LSA not established. Effects outside of the SSA are not predicted.	RSA not established. Effects outside of the SSA are not predicted.
Human Health	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Economic and Social	The communities of the Towns of New Glasgow, Pictou, Stellarton, Trenton, and Westville.	The province of Nova Scotia.

Component assessed by Proponent	Local Study Area	Regional Study Area
Mi'kmaq of Nova Scotia – Archaeological and Cultural Heritage Resources	LSA not established. Effects outside of the SSA are not predicted.	RSA not established. Effects outside of the SSA are not predicted.
Mi'kmaq of Nova Scotia	All lands and waters within 500 metres of the SSA.	All lands and waters within five kilometres of the SSA.
Migratory Birds	All lands and waters within 500 metres of the SSA.	All lands and waters within three to five kilometres of the SSA.
Noise	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Surface water	All lands and waters within 500 metres of the SSA.	RSA not established. Effects outside of the LSA are not predicted.
Terrestrial habitat and vegetation	All lands and waters within 500 metres of the SSA.	All lands and waters within three to five kilometres of the SSA.
Mammals and Wildlife	LSA not established. Effects outside of the SSA are not predicted.	RSA not established. Effects outside of the SSA are not predicted.
Greenhouse Gasses	All lands and waters within 500 metres of the SSA.	All lands and waters within three to five kilometres of the SSA.
Wetlands	LSA not established. Effects outside of the SSA are not predicted.	RSA not established. Effects outside of the SSA are not predicted.

Source: Boat Harbour Remediation Project, Environmental Impact Statement, Section 7.3.

Table Description: Local and regional study areas for each valued component assessed by the Proponent.

Appendix D: Species at Risk and COSEWIC-listed Species that May be Found near the Boat Harbour Remediation Project

IAAC has taken a conservative approach to identifying potential species at risk by including all species that were identified by the proponent in the EIS and additional species IAAC believes may occur in the SSA based on other sources, including other EAs and input from federal authorities. The likelihood of a species occurring in the area and the time of year it may be present can vary greatly from one species to another.

Information has been updated in accordance with the Species at Risk Registry.

Species	*Species at Risk Act* Status (Schedule 1)	COSEWIC Status	Observed in SSA/RSA	Federal Recovery Strategy
Migratory Birds				
Common nighthawk (*Chordeiles minor*)	Special Concern	Special Concern	SSA	Yes
Eastern wood-pewee (*Contopus virens*)	Special Concern	Special Concern	SSA	No
Bank swallow (*Riparia riparia*)	Threatened	Threatened	SSA	Yes
Barn swallow (*Hirundo rustica*)	Threatened	Special Concern	SSA	No
Evening grosbeak (*Coccothraustes vespertinus*)	Special Concern	Special Concern	SSA	No
Canada warbler (*Cardellina canadensis*)	Threatened	Special Concern	SSA	Yes

Species	*Species at Risk Act* Status (Schedule 1)	COSEWIC Status	Observed in SSA/RSA	Federal Recovery Strategy
Horned grebe (*Podiceps auritus*) – Magdalen Islands population	Endangered	Special Concern	SSA[43]	Yes
Horned grebe (*Podiceps auritus*) – Western population	Special Concern	Special Concern	SSA	Yes
Lesser Yellowlegs (*Tringa flavipes)*	Not listed	Threatened	SSA	No
Piping plover (*Charadrius melodus melodus*)	Endangered	Endangered	Last observed in SSA in 1991	Yes
Wood thrush *(Hylocichla mustelina)*	Not listed	Threatened	RSA	No
Bobolink *(Dolichonyx Oryzivorus)*	Not listed	Threatened	RSA	No
Fish				
Rainbow smelt (*Osmerus mordax*)	Endangered	Endangered	SSA	Yes
Winter skate (*Leucoraja ocellata*) – Gulf of St. Lawrence population	No Status (under consideration)	Endangered	SSA and RSA	No
Atlantic salmon (Salmo salar) - Gaspe-Southern Gulf of St. Lawrence population	No Status (Under consideration)	Special concern	SSA	No
Atlantic salmon (*Salmo salar*) – Inner Bay of Fundy population	Endangered	Endangered	SSA	Yes

[43] One horned grebe was observed in the SSA in October 2017; however the population was not identified. IAAC has taken a conservative approach to identifying species at risk, therefore two populations of horned grebe are listed.

Species	*Species at Risk Act* Status (Schedule 1)	COSEWIC Status	Observed in SSA/RSA	Federal Recovery Strategy
Striped bass (*Morone saxatilis*) – Southern Gulf of St. Lawrence population	No Status (Under consideration)	Special concern	SSA[44]	Yes
Striped bass (*Morone saxatilis*) – Bay of Fundy population	No Status (Under consideration)	Endangered	SSA	Yes
White hake (*Urophycis tenuis*) - Southern Gulf of St. Lawrence population	No Status (under consideration)	Endangered	SSA	No
American eel (Anguilla rostrata)	No Status (under consideration)	Threatened	SSA	No
Smooth skate (*Malacoraja senta*) - Laurentian-Scotian population	No Status (under consideration)	Special Concern	SSA and RSA	No
Thorny skate (*Amblyraja radiata*)	No Status (under consideration)	Special Concern	SSA and RSA	No
White shark (*Carcharodon carcharias*) – Atlantic population	Endangered	Endangered	RSA	No
Lumpfish (*Cyclopterus lumpus*)	No Status (under consideration)	Threatened	RSA	No
Atlantic wolffish (*Anarhichas lupus*)	Special Concern	Special Concern	RSA	Yes

[44] Striped bass have been observed in the SSA, however the population(s) were not identified. IAAC has taken a conservative approach to identifying species at risk, therefore two populations of striped bass are listed.

Species	*Species at Risk Act* Status (Schedule 1)	COSEWIC Status	Observed in SSA/RSA	Federal Recovery Strategy
Atlantic sturgeon (*Acipenser oxyrinchus*) - Maritimes populations	No Status (under consideration)	Threatened	Observed 83.1 kilometres from the SSA	No
Marine Mammals				
Blue whale (*Balaenoptera musculus*) – Atlantic population	Endangered	Endangered	RSA	Yes
Fin whale (*Balaenoptera physalus*) – Atlantic population	Special Concern	Special Concern	RSA	No
North Atlantic right whale (*Eubalaena glacialis*)	Endangered	Endangered	RSA	Yes
Harbour porpoise (*Phocoena Phocoena*) – Northwest Atlantic population	No Status	Special Concern	RSA	No

Sources: Boat Harbour Remediation Project Environmental Impact Statement; and Proponents' information requirement responses, 2021. Species listings updated as per Canada's Species at Risk Public Registry, accessible at: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html

Appendix E: Summary of Key Comments Received on the Draft Environmental Assessment Report

Key comments received on the draft report are summarized in the table below. Editorial-related comments and comments that identify basic errors in the draft report were considered and addressed in the report where applicable, and are not included in this table. Comments on the potential EA conditions that resulted in changes to key mitigation measures and follow-up requirements are addressed in the report and/or in revisions to the potential EA conditions, but not all are included in this table.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
Proponent	General	PLFN leadership has made public comments which support the Project.	PLFN participated in the EA process providing written submissions and participating in meetings with IAAC. PLFN have stated to IAAC that it opposes vertical expansion of the containment cell and its permanent use. The April 2024 submission by PLFN states that in 2021 and 2023 PLFN conducted two separate referenda on the use of Boat Harbour. In both cases 98 percent of the people that voted, were against the long-term use of the containment cell.	No modifications made.	No modifications made.
Indigenous Services Canada	General - Conditions	Recommendation that the report indicate that adjustments may be required to follow-up programs as new information becomes available.	IAAC notes that Condition 2.1 requires the Proponent's actions in meeting the conditions to be informed by the best information and knowledge available at the time the Proponent takes an action.	No modifications made.	No modifications made.
Proponent	General – Future land use	The Proponent disagreed that future land-use in the SSA has not been determined yet. The Proponent funded development of a land-use	IAAC notes that PLFN have stated that the land-use plan has never been ratified by the PLFN membership or approved by a formal band council	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		plan for PLFN which lays out the vision for the future of Boat Harbour after the remediation.	resolution of Chief and Council and that it is not an official plan of PLFN.		
Proponent	General - Process	It is expected that as the regulator, Nova Scotia Environment and Climate Change will determine the appropriate design guidelines and standards, and the Proponent will comply.	IAAC acknowledges the provincial regulatory approval processes that will apply to the Project. Throughout the report (including Sections 3, 5.1, 5.3) IAAC describes the role of Nova Scotia Environment and Climate Change as a regulator with respect to the containment cell and wetland function.	No modifications made.	No modifications made.
Proponent	General - Process	With respect to the description in section 5.3.1 on the applicability of the Nova Scotia Contaminated Site Regulations and Ministerial Protocol Framework, it is the Proponent's understanding that the Protocol Framework and the *Contaminated Sites Regulations* will not be utilized directly with this Project and will be used to inform the Industrial Approval that will be issued by Nova Scotia Environment and Climate Change.	This is consistent with IAAC's understanding. Wording revised in Section 5.3.2 of the report for clarification.	Section 5.3.2 revised.	No modifications made.
Proponent	General - Process	It is not clear whether IAAC is approving or rejecting the Project.	Section 1 of the report describes the decision-making process for the EA of the Project. IAAC prepares a final report with its conclusion on whether the Project is likely to cause significant	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
			adverse environmental effects after taking into account the proposed mitigation measures. The Minister of Environment and Climate Change will consider the final version of the report and issue a Decision Statement to the Proponent.		
Proponent	General - Process	Consideration of adverse environmental effects should be based on effects created by the vertical expansion of the containment cell, not as it relates to its overall existence.	Section 2.3 of the report describes the containment cell component of the Project, noting that the existing containment cell would be expanded vertically to accommodate the storage of approximately 930,000 cubic metres of waste. IAAC is of the view that its analysis throughout the report focused on the vertically-expanded containment cell.	No modifications made.	No modifications made.
Proponent	General - Process	IAAC failed to address that if the Project is not approved there is no clear path forward towards the remediation of the Boat Harbour SSA. With no approval for the proposed remediation, the containment cell will continue to exist. The report fails to balance the outcomes of the approval decision. Understanding the outcomes, as noted above, is fundamental to the assessment of environmental impacts.	CEAA 2012 requires the Minister to decide, after taking into account the implementation of any mitigation measures, whether a project is likely to cause significant adverse environmental effects.	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
Proponent	General - Process	The Proponent stated that benefits associated with approval of the Project and its implementation have been communicated to PLFN leadership. The Proponent listed benefits under broad categories of funding, participation, lands and legacy.	IAAC recognizes that the goal of the Project is to remediate Boat Harbour and impacted surrounding lands and waters, and to return it to a functioning tidal estuary with improvements to the health of flora, fauna, birds, wildlife, available for PLFN and the Mi'kmaq of Nova Scotia. CEAA 2012 requires the Minister to decide, after taking into account the implementation of any mitigation measures, whether a project is likely to cause significant adverse environmental effects.	No modifications made.	No modifications made.
Proponent	General - Process	IAAC held numerous meetings with PLFN to discuss the "environmental assessment process" without the Proponent being present at these discussions and without the Proponent ever being provided a record of the discussions.	As described in Section 4 of the report, the federal government has a duty to consult Indigenous groups, and where appropriate, to accommodate when there is knowledge that the federal government's proposed conduct might adversely impact Indigenous rights. IAAC held meetings with PLFN to fulfill its duty to consult.	No modifications made.	No modifications made.
Indigenous Services Canada	General - Requirements	Recommendation that the Proponent works with PLFN and Indigenous Services Canada to ensure access permits are in place for any areas of reserve lands where remediation works will take place.	Section 4.4 has been updated to include information on potential federal authorizations including those that may be provided by Indigenous Services Canada.	Section 4.4 was revised.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
Fisheries and Oceans Canada	Fish and Fish Habitat	Fisheries and Oceans Canada does not consider offsetting as a mitigation measure and emphasizes measures to avoid and mitigate as the preferred steps in the hierarchy of measures, followed by measures to offset as a last resort.	As defined in CEAA 2012, IAAC considered mitigation measures as measures for the elimination, reduction or control of the adverse environmental effects of a designated project and includes restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means. IAAC acknowledges that Fisheries and Oceans Canada does not consider offsetting as a mitigation measure.	No modifications made.	No modifications made.
Proponent	Fish and Fish Habitat – Benthic Habitat / Sediment Transport	The Proponent disagreed that benthic habitat, including the presence or absence of eelgrass, was not adequately studied or described, and references studies and information provided in information requirement responses or completed since the technical review.	Fisheries and Oceans Canada reviewed the Proponent's responses to information requirements and indicated that overall Proponent does not describe the benthic habitat which will be impacted by dredging and increases in TSS. This information will be required during the *Fisheries Act* authorization stage. Condition 3.7 requires the Proponent to collect monitoring data related to benthic habitat and species. Data collected since the development of the EIS and information requirement responses may be submitted for review and consideration in relation to these conditions. IAAC notes that Section 5.1 of the draft report stated that the benthic habitat specifically in the estuary was *not investigated*. This has been revised to state that the Proponent did not	Section 5.1 was revised.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
			adequately describe the benthic habitat in the estuary.		
Proponent	Fish and Fish Habitat – Sediment Transport	The CCME guidelines state that TSS can not be more than 25 mg/L above background levels which was applied in the context of evaluating TSS in the Northumberland Strait. If there is another guideline to be applied, the Proponent should have been informed.	The CCME guideline for TSS used by the Proponent are intended for the protection of aquatic life for short-term exposures of less than 24 hours. Fisheries and Oceans Canada stated during its technical review that given the Project is predicted to impact TSS levels within the marine environment for at least 120 days, the guideline for TSS should be based on long-term exposure.	No modifications made.	No modifications made.
Proponent	Fish and Fish Habitat - Wetlands	With respect to the statement that habitat loss and fragmentation would potentially occur due to the construction and upgrade of the access roads, which would result in the permanent loss of portions of the wetlands, the Proponent noted that Figure 7.3-26 of the EIS shows that the wetlands would be less fragmented after the Project compared to current conditions.	IAAC acknowledges that the purpose of the Project is to remediate a contaminated site, resulting in an overall improvement to areas including fish and fish habitat and migratory birds and that the extent of wetlands directly impacted by the Project is based on preliminary remedial objectives which will be finalized during the provincial approval process under the Nova Scotia *Environment Act*.	No modifications made.	No modifications made.
Sipekne'katik First Nation	Fish and Fish Habitat - Wetlands	Concern about risks associated with the potential leakage or spills of hazardous materials from the containment cell, which could	Section 6.1 of the report provides an analysis of potential effects of accidents and malfunctions, including containment cell failure, and outlines mitigation and follow-up measures.	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		further damage the fragile wetland ecosystem.			
Environment and Climate Change Canada	Migratory Birds	Recommended the addition of a condition requiring covering of stockpiles or patches of bare soil to discourage ground-nesting species from nesting in work areas, as well as inspection of uncovered areas before activity.	IAAC has added Condition 4.5, which requires the Proponent to cover bare soil or stockpiles during nesting season. Condition 4.2 requires the Proponent to determine the presence, or likely presence of migratory bird nest(s) prior to initiating an activity that may adversely affect them.	Section 5.2 was revised.	Conditions 4.5 was added.
Environment and Climate Change Canada	Migratory Birds	Recommended the addition of mitigation measures respecting the Pileated Woodpecker and Great Blue Heron which have been observed within the SSA and have year-round nest protection.	IAAC is of the view that the requested information is addressed through Condition 4.1 which requires that all activities associated with the Project will be executed in a manner that protects migratory birds and their nests while taking into account Environment and Climate Change Canada's *Guidelines to Avoid Harm to Migratory Birds* which include information on determining presence of nests.	No modifications made.	No modifications made.
Environment and Climate Change Canada	Migratory Birds	Recommendation to add information on requirements for the protection of nests under the *Migratory Birds Regulations.*	Section 5.2.1 was revised to include this information.	Section 5.2.1 was revised.	No modifications made.
Environment and Climate Change Canada	Migratory Birds – Species at Risk	Wildlife response plan should include information about species at risk and their nesting habitat/times.	Condition 10 has been revised to include a requirement for consultation with Environment and Climate Change Canada in development of the emergency response plan. The plan will	Section 6.1 was revised.	Condition 10 was revised.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
			include measures for response, protection and rehabilitation of birds.		
Health Canada	Health - Air Quality	Recommendation that “or other dust suppressants” be removed from Condition 5.1.1, as the Proponent’s response to an information requirement stated that only fresh potable water was considered for dust suppression.	Condition 5.1 was revised. If the Proponent wishes to use a dust suppressant other than water, the Proponent must determine an alternative dust suppressant to be used in consultation with Health Canada and Nova Scotia Environment and Climate Change.	Section 5.3 was revised.	Condition 5.1 was revised.
Indigenous Services Canada	Health – Drinking Water	The Atlantic First Nation Water Authority is responsible for the operation, maintenance and capital upgrades of PLFN’s water and wastewater assets and should be consulted. Recommend referencing and including the Atlantic First Nation Water Authority in discussions related to PLFN’s drinking water system.	Comment noted and highlighted here for the Proponent’s awareness.	No modifications made.	No modifications made.
Proponent	Health – Human Health Risk Assessment	Any requirement for a future HHRA would be dependent on the results of the follow-up and monitoring programs.	If follow-up and monitoring programs identify unacceptable human health risks after remediation, the Proponent would be required to update the HHRA. Condition 5 was updated to reflect this.	Section 5.3 was revised.	Condition 5 was revised.
Proponent	Health – Human Health Risk Assessment	In response to Health Canada's comment that some shellfish were screened out of the HHERA using inadequate methods, the Proponent	Health Canada noted during the technical review that it is inappropriate to determine COPCs or characterize potential health risks from consuming contaminated clams based on the	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		stated that shellfish consumption was not screened out. Shellfish were included and compared to background.	background data collected from different shellfish species without sufficient rationale. IAAC notes that the HHRA will be reevaluated (Condition 5.3) in consultation with Health Canada, Nova Scotia Environment and Climate Change, and the Mi'kmaq of Nova Scotia to determine whether modifications are required.		
Proponent	Health – Human Health Risk Assessment	The Proponent noted its disagreement with Health Canada's various concerns with the methodology used by the Proponent to conduct its HHERA and develop proposed remedial objectives. The Proponent stated that the HHERA was completed by the American Board of Toxicology Certified Toxicologists and in accordance with accepted National Standards.	IAAC notes that the EA process involved the technical review of the EIS prepared by the Proponent. Federal authorities such as Health Canada provide technical expertise to IAAC; comments were also considered from Nova Scotia Environment and Climate Change. Information requirements on the HHERA/HHRA and determination of remedial objectives incorporated technical review comments, and responses to information requirements prepared by the Proponent were subject to further review by IAAC and Health Canada. IAAC notes that the HHRA would be reevaluated prior to site preparation (Condition 5.3) and if required, the HHRA would be modified and remedial objectives would be recalculated (Condition 5.4) in consultation with Health Canada, Nova Scotia Environment and Climate Change, and	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
			the Mi'kmaq of Nova Scotia. IAAC is of the view that the conditions are required to address uncertainties and mitigate the potential for adverse environmental effects.		
Proponent	Health – Mental Health and Well-being	The Proponent stated that there are several negatively biased statements quoted from the PLFN Well-being Baseline Study that do not reflect the conclusion of the report: "So, I really do want remediation to happen, and I believe…that's when we are going to start healing and trying to become closer and just having a better life all together".	IAAC acknowledges that this quote was placed within the conclusion section of the PLFN Well-being Baseline Study. The quote was attributed to one participant and noted by the authors as the "most powerful". IAAC presented the quote in full in the report.	No modifications made.	No modifications made.
Indigenous Services Canada	Health – Mental Health and Well-being	The report should address the potential for psychological trauma in the community as a result of euthanizing fish and the permanent loss of a portion of wetlands. Suggested adding information describing measures preventing future access to contaminated fish, as well as information on the science and health related justifications underpinning the necessity of contaminated fish removal.	Section 5.1.2 of the report provides IAAC's analysis of fish and fish habitat, including measures to euthanize fish from Boat Harbour and surrounding fresh waterbodies prior to remediation activities. Section 5.5.1 notes that PLFN expressed concern about the psychological trauma that euthanizing the fish may cause the community. IAAC notes that the purpose of the Project is to remediate a contaminated site, resulting in an overall improvement to areas including fish and fish habitat and migratory birds. The Proponent would be required to develop a protocol for the euthanization of fish (Condition	No modifications made.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
			3.3.3) in consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and Fisheries and Oceans Canada and to identify opportunities for their participation in the euthanization. After remediation, the Proponent will be required to conduct follow-up monitoring of country foods (including fish), which would identify whether country foods are safe to consume, and if not, administrative controls such as country food advisories would be implemented. Less than four hectares of wetlands were predicted to be permanently lost, representing less than one percent of the total area of the SSA. Nova Scotia Environment and Climate Change will require the Proponent to compensate for wetland functions lost due to the Project.		
Indigenous Services Canada	Health – Mental Health and Well-being	The report should include a discussion on how the short and long-term adverse impacts to mental health and well-being will be addressed, considering the primary cause, as stated by the PLFN, is the proposed project location and the everlasting presence of the containment cell.	The report and conditions have been revised to include measures to reduce the likelihood of the vertically-expanded containment cell remaining in the SSA permanently. IAAC is of the view that these additional mitigation measures address potential adverse effects on health conditions, including mental health and well-being.	Section 5.4 was revised.	Condition 9 was added.

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Indigenous Services Canada	Health – Soil / Country Foods	To address the PLFN's concerns with existing soil contamination and food insecurity, the Proponent should identify and delineate the extent of contamination and work with the PLFN community to determine soil remediation objectives and achieve said objectives during site remediation. The report should discuss whether soil contamination may impede PLFN's use and enjoyment of the lands and/or result in impacts on the health, social, and economic conditions of PLFN.	In response to PLFN's concern about potential land-use restrictions in the SSA after remediation, the Proponent will be required (Condition 5.3) to reevaluate the parameters used in the HHRA prior to site preparation, and if required, modify the HHRA and recalculate the remedial objectives. The modified HHRA and remedial objectives will be submitted to Nova Scotia Environment and Climate Change to inform the provincial approval process and the finalization of the remedial objectives for the Project. Although residual contamination is expected after remediation is complete, IAAC is of the view that the Project will reduce the existing risks to human health. The Proponent would be required to assess residual post-remediation risks to the health of PLFN and the Mi'kmaq of Nova Scotia through follow-up monitoring (including of country foods and soil) and based on the results, may be required to update the HHRA. If unacceptable human health risks are identified after remediation has occurred, measures will be implemented to ensure the protection of human health. Measures could include administrative controls such as restricting access to portions of the SSA, or country food bans.	Section 5.3 was revised.	Condition 5.3 was added.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
PLFN	Indigenous - Consultation	Consultation, engagement, collaboration, monitoring, reviewing, commenting, and overseeing, are all time consuming and expensive activities. The Proponent should be required, through conditions, to reimburse the Mi'kmaq of Nova Scotia for reasonable expenses incurred in connection with any consultation, collaboration, agreement, review, oversight or monitoring activity contemplated in the conditions.	Condition 2.4 requires that, where consultation with the Mi'kmaq of Nova Scotia is a requirement of a condition or a follow-up program, the Proponent must seek mutual agreement with the Mi'kmaq of Nova Scotia on the manner in which consultation requirements will be satisfied, including the resources to be provided to support consultation activities.	No modifications made.	No modifications made.
Sipekne'katik First Nation	Indigenous - Current Use	Highlight that despite the proposed remediation efforts, it is highly unlikely that PLFN and the broader Mi'kmaq community will resume traditional use in the Boat Harbour area. Additional compensation is necessary to address the permanent loss of Mi'kmaq Constitutional Rights in this region due to a project Mi'kmaq communities have always contested. Recommendation that the Proponent ensure the proper remediation of the wetlands and relocate the hazardous waste to a secure	IAAC is of the view that additional conditions (Condition 9 and its sub-conditions) will reduce the likelihood of the containment cell remaining in the SSA permanently, which will reduce impacts to rights. Condition 9 requires the Proponent to: ensure the containment cell is reconstructed in a manner such that the waste can be removed; establish an Advisory Committee to seek out and assess potential alternative locations for the waste; and move the waste and decommission the containment cell should an alternative location be identified (subject to any regulatory approvals, permits, or appropriations).	Section 5.4 was revised.	Condition 9 was added.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		containment facility at an alternative site away from the reserve and traditional Mi'kmaq lands.			
PLFN	Indigenous – Current Use	Conditions 7.1 and 8.1 should be revised to add “acceptable to and approved by PLFN” with respect to the services of Indigenous monitors and a third-party independent environmental monitor.	IAAC understands that Indigenous or third-party independent environmental monitors must be selected in accordance with provincial procurement policies and agreements.	No modifications made.	No modifications made.
PLFN	Indigenous - General	The report references 128 acres of land to be transferred to PLFN. It should be noted that land transfers were promised to PLFN in the 1990s once the then promised cleanup of Boat Harbour had taken place. As such, the transfer of those 128 acres of land is to fulfil a longstanding legal obligation of the Province, rather than reflecting any fresh accommodation measures.	IAAC notes that Section 5.5.1 of the report states the following "The Proponent committed to the transfer of up to 173 hectares of provincially owned lands to PLFN after the Project is completed to provide some accommodation to PLFN for any potential limitations in land use as a result of the continued existence of the containment cell. However, PLFN stated that most of these lands were previously committed to before the commencement of the EA and should not be regarded as an accommodation for potential effects of the Project." Section 2 of the report has been revised for clarity.	Section 2 has been revised.	No modifications made.
Proponent	Indigenous – Physical and Cultural Heritage	The Proponent does not agree with IAAC's conclusion in the draft report that effects to the cultural heritage of the	IAAC is of the view that additional conditions (Condition 9 and its sub-conditions) will reduce the likelihood of the containment cell remaining in the	Section 5.4 was revised.	Condition 9 was added.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		Mi'kmaq of Nova Scotia and PLFN would be high in magnitude, with long-term duration, continuous frequency, and irreversible.	SSA permanently, which will reduce impacts to rights. Condition 9 requires the Proponent to: ensure the containment cell is reconstructed in a manner such that the waste can be removed; and establish an Advisory Committee to seek out and assess potential alternative locations for the waste. Should an alternative location be identified, the Proponent will be required to move the waste and decommission the containment cell (subject to any regulatory approvals, permits, or appropriations).		
Proponent	Indigenous – Physical and Cultural Heritage	The role of an Indigenous monitor will be addressed in the Proponent's project governance documents.	Condition 7.1 requires the Proponent to retain the services of Indigenous monitors to observe, record, and report on the implementation of the conditions. IAAC acknowledges the Proponent's intent to include information on this role in governance documents for the Project.	No modifications made.	No modifications made.
Proponent	Indigenous - Rights	The following statement in the report is incorrect: the Proponent acknowledged that the permanent use of the on-site containment cell for the long-term storage of hazardous waste would continue to negatively impact PLFN's section 35 rights at this site and surrounding reserve lands.	Section 7.2 was corrected.	Section 7.2 was revised.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		The Proponent recognized a restriction within the confines of the containment cell property itself, which comprises one percent of the SSA. The Proponent does not acknowledge that "the area containing the containment cell would continue to restrict PLFN's ability to exercise their section 35 rights within the SSA..."			
Proponent	Indigenous - Rights	IAAC EIS Guidelines neither referenced nor defined “cultural continuity” as an element of the EA. It is administratively unfair to base a fundamental premise upon which the Project may be approved or rejected without having given the Proponent a definition of the same and the opportunity to address such a matter in the context of the Project and management of any potential environmental effects in the EIS. The Proponent has undertaken many activities and initiatives which it believes support cultural continuity, which have not been factored into IAAC’s decision. IAAC seems to have only considered cultural continuity	IAAC notes that the EIS Guidelines do not specify types of rights for review in the EIS. Section 6 of the Guidelines required that the EIS document information such as location of a right being practiced, how often the right is practiced, and the context in which the right is practiced, including how the right was practiced historically. IAAC is of the view that "cultural continuity" is not a new concept; it is the language chosen to express the right to continue a way of life, including cultural and spiritual practice. IAAC is of the view that Section 7.2.3 of the draft report explains this: IAAC understands that cultural continuity and the ability to practice their Mi’kmaq way of life is of great importance to PLFN and the Mi’kmaq of Nova Scotia. Cultural and spiritual practice is essential to their relationship and connection to A’se’k and to their	Section 7.2.3 was revised.	No modifications made.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		impacts in relation to a state of A'se'k which existed before the establishment of the effluent treatment facility in the 1960s, and not the existing baseline condition, which includes the existence of the containment cell. This is a fundamentally incorrect approach to determining significant adverse effects of a proposed project.	Mi'kmaq identity and cultural survival. Cultural and spiritual connections to A'se'k create a sense of place and are critical to mental and community well-being. For the sake of clarification select wording in Section 7.2.3 has been revised. IAAC is of the view that its analysis is of the effects of the vertically-expanded component of the Project.		
Indigenous Services Canada	Indigenous - Rights	In its mandated role to support the implementation of the *United Nations Declaration on the Rights of Indigenous Peoples Act*, Indigenous Services Canada recommends that the Proponent work collaboratively with PLFN to address their concerns and obtain the community's free, prior, and informed consent prior to remediating the Boat Harbour site.	As stated in Section 7 of the report, IAAC's work was guided by the *Principles respecting the Government of Canada's Relationship with Indigenous Peoples*, and the Government of Canada's commitment to implement the *United Nations Declaration on the Rights of Indigenous Peoples Act*. IAAC's aim was, to the extent possible, to secure free, prior, and informed consent. IAAC worked collaboratively with PLFN to ensure opportunities for effective and meaningful participation throughout the EA process and worked together to find creative ways to address PLFN's key issues affecting their community. The report and conditions have been revised to include measures to reduce the likelihood of the vertically-expanded containment cell remaining in the SSA permanently, the key issue of PLFN's opposition.	Report has been revised throughout, including Sections 5.4, 5.5, and 7.	Condition 9 was added.

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
PLFN	Indigenous - Rights	Canada's duty to consult and accommodate before approving of the Project is broader than the EA process and relying on the EA process alone is not sufficient to discharge fully Canada's duty to consult. As an example, while an assessment of the strength of the Aboriginal title claims to the land on which the proposed containment cell would be situated may be beyond the scope of an environmental review, it is something Canada must consider in carrying out its duty to consult and accommodate. This is of vital importance. A finding of Aboriginal title would mean that the Project could not be approved without PLFN's consent. Accordingly, we expect the Minister, and potentially the Governor in Council, to address this issue before deciding to approve the Project.	Section 7 of the report provides IAAC's analysis of impacts to PLFN and the Mi'kmaq of Nova Scotia's section 35 rights. To inform the Minister on the EA for the Project, IAAC will include information about issues raised throughout the EA by PLFN and the Mi'kmaq of Nova Scotia including PLFN's Aboriginal title claim to the lands which would occupy the vertically-expanded containment cell and measures that IAAC considers appropriate to minimize and/or accommodate, where possible. Section 7.3 of the report states that, should the Project proceed, federal authorities with a regulatory role will continue consultation with Indigenous groups after the EA decision is issued. Comments from PLFN received during the EA will be shared directly with federal authorities to inform their decision-making. As applicable, the decisions by federal authorities would take into account the outcomes of ongoing consultation with PLFN on behalf of the Mi'kmaq of Nova Scotia and the consultation record resulting from the EA.	No modifications made.	No modifications made.
PLFN	Indigenous - Rights	A discussion about the Aboriginal right to use and enjoyment of lands, which encompasses all uses, should be included in the report. For	IAAC acknowledges this comment and the importance of use and enjoyment to PLFN, and that effects from the Project are likely not limited to impacting a single category of rights. For the	No modifications made	No modifications made

Participant	Subject	Summary of Comment or Concern	IAAC Response	Changes to report	Changes to conditions
		example, it will not be possible to locate a residence on portions of Indian Reserves 37 and 24G because of their proximity to the containment cell.	purposes of the EA, IAAC focused on the potential to impact PLFN's rights to fish, hunt, trap, gather, and the Mi'kmaq way of life, including cultural continuity. IAAC acknowledges that throughout the EA, PLFN continuously expressed opposition to the Project, specifically the vertically-expanded containment cell onsite; stating that its permanent use would infringe their rights to use the lands, not just for traditional purposes, which are occupied by the containment cell and surrounding lands. IAAC is of the view that after remediation it is unlikely that PLFN would resume use and enjoyment in and around A'se'k due to the presence of the vertically-expanded containment cell if it remained permanently in place. Therefore, IAAC is also of the view that PLFN would be unlikely to utilize A'se'k to exercise their rights in the future while the vertically-expanded containment cell remains in the SSA. IAAC is of the view that with additional conditions noted above the likelihood of the containment cell remaining in the SSA permanently is minimized. IAAC is of the view that PLFN would likely be able utilize A'se'k to exercise their rights, including the use and enjoyment of lands in the future.		

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PLFN	Indigenous - Rights	PLFN's claim of Aboriginal title should be addressed in the report. Recommendation to state in the report that an analysis of Aboriginal title claims was beyond the scope of the EA and no strength of claim analysis has been carried out.	The EA is not a rights determination exercise and as such, an analysis of title claim is outside the scope of the EA process. IAAC will not be undertaking an analysis of PLFN's assertion of Aboriginal title in the report. Section 7.1 of the report states that the Mi'kmaq of Nova Scotia assert Aboriginal title to all the lands and waters of Nova Scotia, including the offshore. Specifically, PLFN assert Aboriginal title to the lands surrounding Boat Harbour, including the lands on which the containment cell is located. The Governments of Canada and Nova Scotia continue to work with the Mi'kmaq of Nova Scotia to negotiate outstanding Treaty, title, and Aboriginal rights questions in Nova Scotia, and continue to seek to address PLFN's concerns in relation to the Project.	No modifications made.	No modifications made.
Sipekne'katik First Nation	Indigenous - Rights	The Project is located in Mi'kma'ki, the ancestral territory of the Mi'kmaq. Each Mi'kmaq Band holds Treaty and Aboriginal Rights over lands, waterways and natural resources that they have utilized, benefitted from, and occupied since time immemorial - no undertaken activity shall impede the exercise of such Rights. Given its cultural and environmental significance to the Mi'kmaq people, it is still unfortunate	Comment acknowledged. Section 7.1 of the report describes the Project's location in Mi'kma'ki and the Mi'kmaq of Nova Scotia's claim to all of Nova Scotia as their traditional territory. Section 4.1 identifies the 13 Mi'kmaq communities of Nova Scotia. Section 1.1.2 describes the significance of A'se'k to the daily life of Mi'kmaq.	No modifications made.	No modifications made.

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		that such activity was initially authorized in this area.			
PLFN, Indigenous Services Canada	Federal Lands	The report should include an analysis of the impact of the Project on Indian Reserves 37 and 24G, including future use and development of those parcels by PLFN.	Section 2 of the report, including Figure 1, describes the location of the containment cell between Indian Reserves 37 and 24G. The report has been revised to include its analysis on Indian Reserves 37 and 24G in a section specific to effects on Section 5(1)(b) of CEAA 2012 which includes federal lands.	Section 5.6 was added.	No modifications made.
Transport Canada	Navigation	Potential impacts to navigation should be considered.	Section 5.5.1 of the report includes information on the replacement of the causeway at Highway 348 with a bridge and the restoration of access for recreational and small fishing boats into Boat Harbour. Section 5.5.2 has been updated to consider the restoration of navigation into Boat Harbour. Appendix B has been updated with information on the specific approval(s) that may be required under the *Canadian Navigable Waters Act*.	Section 5.5.2 and Appendix B was revised.	No modifications made.