Appendix B
Environmental Management and Control Documents

Environmental Management Plan

Environmental Management Plan

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

This document is in draft form. A final version of this document may differ from this draft. As such, the contents of this draft document shall not be relied upon. Author disclaims any responsibility or liability arising from decisions made based on this draft document.

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Environmental Management Plan

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Revision History

Version	Revision Date (dd/mm/yy)	Revision Notes
1.0	30 September, 2020	Initial Draft

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Executive Summary

Boat Harbour, formerly known as A'se'k in Mi'kmaq, was originally a tidal estuary connected to the Northumberland Strait in Nova Scotia. The Province of Nova Scotia (Province) constructed the Boat Harbour Effluent Treatment Facility (BHETF) in 1967 to treat effluent from industrial sources including a bleached Kraft Pulp Mill (Mill). Its construction included reconstructing the natural tidal estuary into a closed effluent stabilization basin.

Following approvals, the Province will remediate Boat Harbour and lands associated with the BHETF, and restore Boat Harbour to a connected tidal estuary. The existing causeway along Highway 348 and the dam will be removed and replaced with a bridge to permit boat access to Boat Harbour. As part of the remediation work, hazardous and non-hazardous waste-bearing sediment from the BHETF will be removed and stored on-site in the improved waste Containment Cell (CC) located adjacent to the BHETF, on lands owned by the Province.

The Boat Harbour Remediation Project (BHRP or the Project) spans from the wastewater effluent pipeline from the first standpipe on the Mill property, through existing and historic BHETF lands, Boat Harbour and its banks, extending to Northumberland Strait, and Pictou Landing First Nation (PLFN), located between Boat Harbour and Northumberland Strait.

The BHRP is regulated by the Impact Assessment Agency of Canada (IAAC) under Section 16(d), of the Regulations Designating Physical Activities that states the Project triggers Canadian *Environmental Assessment Act* (CEAA), 2012. This Environmental Management Plan (EMP) has been prepared by Nova Scotia Lands Inc., (NSLI/the Proponent) for the BHRP in accordance with the project Environmental Impact Statement (EIS) for the Project.

This EMP -is a living document that ensures that project will be reflective of legislative and environmental responsibilities but is sensitive to any changes that might arise during its implementation. At a high level it describes each component and the plan to protect and mitigate/manage/minimize any negative environmental effects throughout the project. The EMP will serve as an early warning system through implementation of the Environmental Effects Monitoring Plan (EEM). The EEM results will alert the Proponent/contractor(s) of any changes that may occur, either negative or positive. Any impact observed will be reviewed to determine the nature of the impact and in the case of a negative impact to implement alternative mitigative measures. It is NSLI's commitment to deliver the Project in a safe manner that is protective of human health and the environment. The EMP will form an important cornerstone in all contractual phases of the Project such that all Project participants (Contractor(s) and stakeholders) will be responsible for adherence to the EMP; under the accountability of NLSI

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Table of Contents

DRAFT

DRAFT

DRAFT

Figure Index

Table Index

Appendix Index

DRAFT

List of Acronyms

ASB	Aeration Stabilization Basing
ASTM	American Society for Testing and Materials
BH	Boat Harbour
BHCC	Boat Harbour Clean-Up Committee
BHEAC	Boat Harbour Environmental Advisory Committee
BHETF	Boat Harbour Effluent Treatment Facility
BHSL	Boat Harbour Stabilization Lagoon
BMP	Best Management Practices
CAEAL	Canadian Association for Environmental Analytical Laboratories
CEAA	Canadian Environmental Assessment Act
CC	Containment Cell
CCME	Canadian Council of Ministers of the Environment
CLC	Community Liaison Coordinator
CM	Construction Manager
CMOC	Construction Management and Oversight Consultant
COC	Contaminants of Concern
COPC	Contaminants of Potential Concern
CRP	Complaint Response Protocol
CSA	Canadian Standard Association
CWS	Canada Wildlife Services
D/F TEQ	Dioxin/Furan Total Equivalency Factor
DFO	Department of Fisheries and Oceans Canada
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EEM	Environmental Effects Monitoring
EM	Environmental Manager

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EMP	Environmental Management Plan
EPC	Estimate of Probable Cost
EPP	Environmental Protection Plan
ESC	Erosion and Sediment Control
FML	Flexible Membrane Liner
GCL	Geosynthetic Clay Liner
GHD	GHD Limited
GHG	Greenhouse Gas
GNS	Government of Nova Scotia
ha	Hectares
HASP	Project Health and Safety Plan
HHERA	Human Health and Ecological Risk Assessment
HHRA	Human Health Risk Assessment
IA	Industrial Approval
IM	Independent Monitor
ISC	Indigenous Services Canada
km	Kilometre
L	Litre
LFG	Landfill Gas
m	Metre
m^3	Cubic Metre
mAMSl	Metres Above Mean Sea Level
mg	Milligrams
Mill	Kraft Pulp Mill
NSLI	Nova Scotia Lands Inc. or Proponent
NSE	Nova Scotia Environment
NS DLF	Nova Scotia – Department of Lands and Forestry
NS TIR	Nova Scotia Department of Transportation and Infrastructure Renewal
NTU	Nephelometic Turbitity Units

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PAH	Polycyclic Aromatic Hydrocarbon
PEPP	Project Environmental Protection Plan
PHASP	Project Health & Safety Plan
PLFN	Pictou Landing First Nation
PM_{10}	Particulate Matter with Aerodynamic Diameter less than or equal to 10 microns
$PM_{2.5}$	Particulate Matter with Aerodynamic Diameter less than or equal to 2.5 microns
POL	Petroleum, Oils, or Lubricants
QA/QC	Quality Assurance/Quality Control
QMP	Quality Management Plan
SAR	Species at Risk
SARA	Species at Risk Act
SB	Settling Basins
SMP	Spills Management Plan
SOCC	Species of Conservation Concern
SSEPP	Site-Specific Environmental Protection Plan
SSTL	Site Specific Target Levels
TDS	Total Dissolved Solids
TLTS	Temporary Leachate Treatment System
TSP	Total Suspended Particulate
TSS	Total Suspended Solids
TVOC	Total Volatile Organic Compound
VOC	Volatile Organic Compound

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1. Introduction

The Province of Nova Scotia have committed to remediate the Boat Harbour Effluent Treatment Facility (BHETF), a project to be managed and implemented by Nova Scotia Land Inc. (NSLI). The purpose of the Boat Harbour Remediation Project (the Project or BHRP) is to remediate Boat Harbour, and lands associated with the BHETF. The goal of the Project is to return Boat Harbour to a tidal estuary, which necessitates the remediation of contaminated sediments within Boat Harbour. Remediation of Boat Harbour will improve water quality and increase marine habitat. Since Boat Harbour is not currently considered to be a high value habitat, once the contaminated sediment is removed and remediation activities are complete, the overall impacts of the Project on the environment will be positive.Through the Project, it is Pictou Landing First Nation's (PLFN) desire and vision that Boat Harbour, (known to PLFN as A'se'k) be remediated and eventually be naturally restored to allow the community to re-establish its relationship with the water and land of A'se'k.

This Environmental Management Plan (EMP) has been prepared by NSLI for the BHRP in accordance with the Environmental Impact Statement (EIS) for the Project. The EMP is a living document that ensures that the Project, will be reflective of legislative and environmental responsibilities but is sensitive to any changes that might arise during its implementation. At a high level it describes each component and the plan to protect and mitigate/manage/minimize any negative environmental effects throughout the Project.

The EMP will also serve as an early warning system through implementation Environmental Effects Monitoring Plan (EEM) to alert the Proponent/Contractor(s) of any changes that may occur either negative or positive. Any impact observed will be reviewed to determine the nature of the impact and in the case of a negative impact to implement alternative mitigative measures. It is NSLI's commitment to deliver the Project in a safe manner that is protective of human health the environment. The EMP will form an important cornerstone in all contractual phases of the project with all Project participants (contractor(s) and stakeholders) being responsible for its implementation under the accountability of NSLI, who will rigorously enforce the EMP.

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The main components of the BHETF include the wastewater effluent pipeline (over 3 kilometres [km] in length) that extends from the Kraft Pulp Mill (Mill) eastward, underneath the East River, to the BHETF property, Settling Basins (SB) and an Aeration Stabilization Basin (ASB) west-southwest of Boat Harbour (BH), and Boat Harbour Stabilization Lagoon (BHSL). Effluent from Boat Harbour discharges through a dam (northeast of Boat Harbour) into an estuary before being released to the Northumberland Strait. Prior to the construction of the SB and ASB, effluent was routed by open ditch from the pipeline on the east side of Highway 348 to natural wetland areas (Former Ponds 1, 2, and 3) before being discharged into BHSL. The existing containment cell (CC), located on provincially owned lands southeast of the ASB will also be used and closed as part of the Project. The area encompassing these features are referred to throughout this report as the Site Study Area or "Site". The BHRP Site and key features are shown on Figure 1.1.

GHD, acting as the General Services Consultant to NSLI, prepared the initial EMP.

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Figure 1.1 Boat Harbour Remediation Project Site

1.1 Project Overview

As part of the remediation work, the existing causeway along Highway 348 and the dam will be removed and replaced with a bridge to allow return to tidal conditions and permit boat access to Boat Harbour. Construction activities will be directly contracted by NSLI, with oversight by a Construction Management and Oversight Consultant (CMOC). Accordingly, the Project EMP and associated Project Environmental Protection Plan (PEPP) provided under a separate cover, serve as umbrella documents to guide environmental protection aspects of all relevant site activities during the Project. The development and maintenance of environmental management planning initiatives are an integral part of the scope of work. This includes environmental effects monitoring (EEM) programs and mitigative measures and follow-up monitoring plans; in addition to an overall Project Health and Safety Plan (HASP) which will be prepared by the CMOC.

It is expected that all Contractor(s) retained to complete the physical remediation and closure work on the Project will be required to develop Site-Specific EPPs (SSEPPs) for the Project components for which they are responsible. The SSEPPs will detail the relevant Best Management Practices (BMPs) mitigation measures, monitoring requirements and reporting. These stand-alone plans will be developed prior to the start of construction works and amended throughout the Project when construction works requiring more detailed environmental planning are identified. The SSEPPs and any amendments will be subject to the review by the CMOC and acceptance by NSLI to ensure compliance with the overall plan. This EMP will be updated with the appropriate information based on the environmental conditions at the Site, as project detail changes and with PEPP and SSEPPs.

1.2 Historical Background

The BHETF was constructed by the Province of Nova Scotia in 1967 to receive and treat liquid effluent produced by the Mill located at Abercrombie Point. The BHETF is owned by the Nova Scotia Department of Transportation and Infrastructure Renewal (NS TIR) and leased to the Mill. The property comprising the BHETF and pipeline corridor is consisting of 34 parcels of land and has an area of approximately 546 hectares (ha). Approximately half of the BHETF is covered by water, and most of the water features were formerly or are currently used as part of the wastewater effluent treatment process. Adjacent lands are owned by provincial, and private landowners, including forest management areas owned by PLFN.

Boat Harbour, which no longer receives and treats the Mill effluent, will be remediated. Boat Harbour has been extensively studied is known to contain contaminants in the sediment such as: elevated levels of zinc, cadmium, mercury, dioxins, furans and polycyclic aromatic hydrocarbons. The overall goal will be to remove the contaminants and return Boat Harbour to tidal influence. This will include the removal of a causeway, installation of a new bridge spanning the outlet and removal of the dam following remediation.

The Site Study Area does not include any protected or designated areas, but it does contain a total of 25 wetlands and wetland complexes. The Boat Harbour estuary is located within the Study Area.

According to the Nova Scotia Department of Lands and Forestry (NS DLF), the Site is dominated by Natural Stand (Forested) closely followed by Wetland. The dominant forest stands are mixed wood

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stands (38.9 percent coverage), followed by hardwood stands (38.6 percent), and softwood stands (22.5 percent).

1.3 Project Environmental Mechanism

In Canada, the Project is regulated by the Impact Assessment Agency of Canada (IAAC) under *Canadian Environmental Assessment Act* (CEAA), 2012. Section 16(d) of the Regulations Designating Physical Activities states the Project triggers CEAA (2012) and it has been determined that an Environmental Assessment Report (EIR) is required for the Project.

To satisfy the federal Environmental Assessment (EA), an EIS was prepared, which identified critical areas within the Site where environmental considerations will be focused to ensure that the Project will not cause negative impact to the immediate and surrounding areas. These areas include the BHSL, estuary, wetlands, wildlife habitat and PLFN hunting and gathering lands.

1.4 Objectives of the EMP

The overall objectives of this EMP are to provide a comprehensive strategy for ensuring compliance with the relevant environmental legislation, polices and permitting requirements, and to provide a Project EMP and to ensure that the environment is protected throughout the life of the Project.

Following approvals, the Province will remediate Boat Harbour and lands associated with the BHETF and restore Boat Harbour to a tidal estuary. The existing causeway along Highway 348 and the dam will be removed and replaced with a bridge to permit boat access to Boat Harbour. As part of the remediation work, waste-bearing sediment from the BHETF will be removed and disposed of in the -CC located adjacent to the BHETF, on provincially owned lands. The closure of the BHETF operations and remediation of BHETF will result in a significant reduction in emissions, discharges, and wastes compared to current operations.

This EMP will apply to all Project elements, span the life of the Project and provide a framework for the environmental management for the entire Project. The consideration of cumulative effects has been addressed in the EIS (refer to Section 7.4.3 for details). While the EMP is meant to provide the Project with stable and consistent environmental guidance, should changes in scope of the Project occur, or if changing or unexpected conditions are encountered during the Project, the EMP will be reviewed and modifications made to ensure the EMP remains current and comprehensive.

The EMP includes requirements and commitments set out in the EIS (GHD, 2020) and provides plans to ensure the planning and execution of the Project also incorporate the core principles of environmental protection, BMP, and comply with all relevant municipal, provincial, and federal legislation and guidelines.

2. Regulatory Approvals, Authorizations and Permits

The Project is regulated under various federal and provincial legislation as well as related policies and/or guidelines and industry codes of practice. These requirements, in Canada and Nova Scotia, have evolved over a number of years to increasingly provide environmental protection and

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sustainable development and ensure that environmental implications of projects are considered during the planning phase.

The list below provides an overview of the regulatory requirements of the Project. While this is not intended to be an exhaustive list of pertinent federal and provincial legislation and policies, it does provide an overview of key regulatory requirements for Project planning and implementation. Depending on the final scope of work as determined in the detailed design, additional relevant legislative, regulatory and approval requirements may also apply and will be identified during completion of the detailed design elements and associated SSEPPs. In addition, regulatory requirements will be reviewed on an on-going basis to ensure that all approvals and permits are obtained in advance of Project activities. A regulatory permits and approvals binder will be maintained and updated as needed to serve as a reference document for NSLI, CMOC, Contractor(s), and subcontractors and the Project.

2.1 Federal Government of Canada

Indian Act (1985) | Approval is required for access and remediation activities on federal crown land from Indigenous Services Canada (ISC) in conjunction with PLFN Band Council Resolution. ISC has granted approvals for access to three Indian Reserve Lands adjacent to Boat Harbour during the planning period and further approvals may be required for the remediation implementation.

Fisheries Act (1985) | A permit from Fisheries and Oceans Canada (DFO) to collect fish prior to construction activity in waters frequented by fish will be required to comply with Section 30(1) and Section 32 of the *Fisheries Act*. The Project is also subject to Section 36(3) of the *Fisheries Act*.

Transportation of Dangerous Goods Act (1992) and Regulations | All waste and/or contaminated materials transported from the Site must be managed and handled as per the requirements of this Act and its Regulations.

Migratory Birds Convention Act (1994) | Adherence to this Act as relates to the protection of protected migratory birds and nests during activities such as clearing and grubbing.

Canadian Environmental Protection Act (1999) | All construction activities must be conducted within the limitations as set out in this Act. Pollution control, waste management and control of toxic substances are just some of the regulations found in this Act that must be followed.

Species at Risk Act (2002) | Adherence to this Act as relates to the regulation of species at risk and their habitat during all site activities.

Canadian Environmental Assessment Act (2012) and Regulations | Adherence to this Act and Regulations by approval, associated permits or exemptions.

Canadian Navigable Waters Act (2019) | Adherence to this Act and Navigation Protection Program Approval.

2.2 Provincial Government of Nova Scotia

Crown Lands Act (1989) | An Approval may be required for the use of Crown Land during all remediation activities.

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Dangerous Goods Transportation Act (1989) | All waste materials and/or dangerous goods stored and/or transported from the Site must be managed and handled as per the requirements of this Act.

Public Highways Act (1989) | Approvals and permits will be required for closure and opening of public roads.

Special Places Protection Act (1989) | An Archaeological Research Permit from the Department of Tourism and Culture will be required to conduct archaeological surveys or for any activity that threatens or disturbs sites declared special places under this Act.

Beaches Act (1989) | A clearance under this Act from the Department of Natural Resources will be required for works seaward of the ordinary high water mark such as sampling or remedial activities that take place between the high and low tide mark of a marine or estuarine environment.

Specific regulations to be applied to the Project will be determined in consultation with the NSE and provided in the Contractor-provided SSEPPs to provide clear guidance to on-site construction personnel.

Nova Scotia Power Privatization Act (1992) | An agreement will be required for service connection to facilitate remediation activities and future service of all Boat Harbour facilities.

Environment Act (1995), Activities Designation Regulations | An Approval under the Activities Designation Regulations (N.S. Reg. 47/95), will be required for specific work conducted at the Site. The list of permits and approvals may include, but not be limited to, the following for NSE:

- Dangerous Goods/Waste Dangerous Goods/Salvage Yard (Division III)
- Industrial (Division V)
- Water (Division I) Approval, Water allocation permit
- Water (Division I) Approval, Wetland alteration permit
- Water (Division I) Approval, Watercourse alteration permit

Environment Act, Emergency Spills Regulations | Adherence to the Emergency Spills Regulations (N.S. Reg. 59/95) will be required for the remedial and construction activities on-site and shall be covered by the Emergency Response and Preparedness Plan and site-specific HASPs.

Environment Act, Dangerous Goods Management Regulations | All waste materials and/or dangerous goods stored and/or transported from the Site must be managed and handled as per the requirements of N.S. Reg. 56/95.

Environment Act, Air Quality Regulations | Adherence to the Air Quality Regulations (N.S. Reg. 28/2005) will be required for any site remediation or construction activities.

Environment Act, Petroleum Management Regulations | Adherence to the Petroleum Management Regulations (N.S. Reg. 44/2002) will be required for the storage of fuels or refueling on-site.

Environment Act, Solid Waste-Resource Management Regulations | Adherence to the Solid Waste-Resource Management Regulations (N.S. Reg. 26/2019) and associated Approval may be required for the disposal of impacted materials in the sludge disposal containment cell (CC) on-site.

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2.3 Municipal Government of the Municipality of Pictou County

Municipal Government Act (1998) | This Act grants power to municipalities to pass by-laws and to govern. Obtaining a building permit will be required for the demolition works. Adherence to the following Pictou County by-laws will be required:

- Building By-Law
- Sewage and Sludge Licensing By-law
- Solid Waste Resource Management By-law
- Spring Road Weight Restriction By-law

As noted in the EIS, the Study Area is subject to the (Draft) Pictou County Land Use By-Law, dated May 6, 2014, and the majority of the lands are not zoned. The southern portion of the PLFN land within the Study Area, however, is zoned as "Forest Management Area" and the northern portion, containing residences, is zoned as "Residential", according to the Pictou Landing Band By-Law No. 1.

3. Environmental Management Team Organization, Structure and Responsibilities

The EMP will be managed and implemented by the Proponent, and the CMOC will ensure that the activities associated with the remediation of Boat Harbour and lands associated with the BHETF and construction oversight services are undertaken in a way that protects and sustains the ecosystem and meets the spirit and letter of all applicable legislated requirements and commitments. Contractor(s) through contractual obligations also share in these environmental responsibilities and shall be responsible for implementing the applicable components of the EMP.

Under the accountability of NSLI, It is the responsibility of the CMOC and the Contractor(s) to develop, coordinate and implement the environmental protection plans, monitoring, contingency plans, emergency response components and Quality Assurance/Quality Control (QA/QC) plans during the construction of the Project. All organizations will work together to ensure that all environmental issues or problems are identified and resolved as quickly and effectively as possible and the appropriate documentation filed.

The following is an outline of the management structure associated with the Project and the responsibilities associated with the various positions. As the Project evolves, the management structure may be altered and responsibilities may be added or taken away from these positions and allocated to others. In addition, field specific roles and responsibilities shall be outlined in more detailed SSEPPs as they are developed.

3.1 Organization and Structure

Figure 3.1: Project Environmental Responsibility and Reporting Structure, provides an overview on the approvals and implementation paths that will be followed over the life of the Project in accordance with the procedures outlined in the EMP. The Project involves many individuals and

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organizations that will be responsible for implementing the EMP. Further specification on the general roles and responsibilities of those involved in the Project follow in the subsequent Sections with additional information found within the PEPP prepared under separate cover.

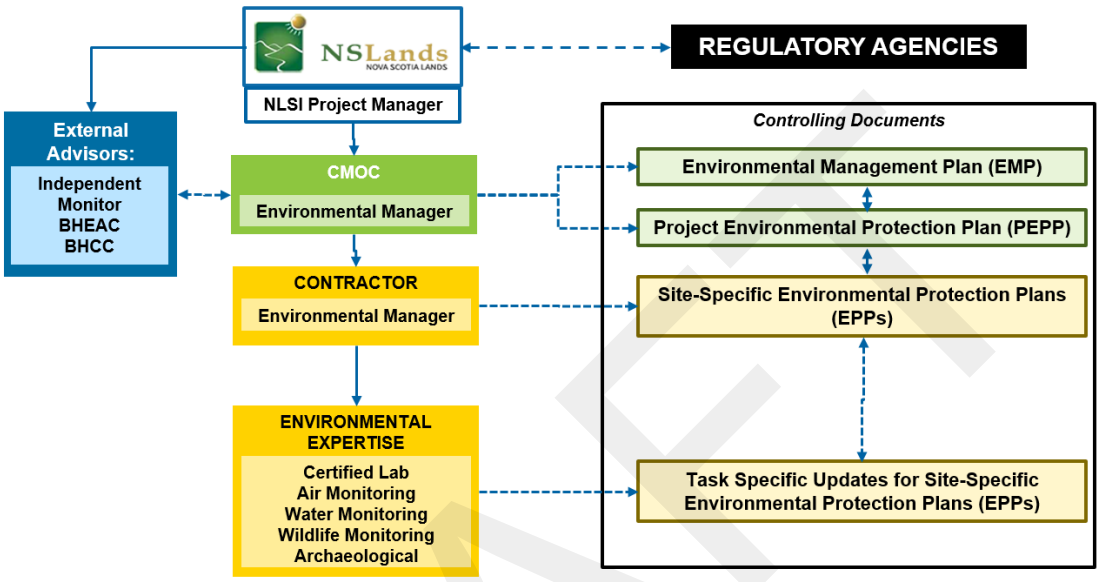

Figure 3.1 Project Environmental Responsibility and Reporting Structure

NSLI will be engaging the CMOC as the oversight consultant for day to day operations, auditing, and compliance monitoring for the works completed by the Contractor(s). The CMOC will be the eyes and ears for NSLI on a daily basis, and the contract services include a full-time Environmental Manager (EM). The CMOC will monitor and advise the Contractor(s) and NSLI of any non-compliant items, including direction for corrective action.

The project construction and remediation works will be completed by the Contractor(s), contracted directly by NSLI. The Contractor(s) will be responsible for the daily activities on the site, including installation and maintenance of physical environmental controls and monitoring of works to ensure daily operations are compliant with the SSEPPs, the contract documents, and by extension this EMP, the PEPP and all applicable permit and regulatory requirements. The Contractor(s) will submit plans for review and approval by NSLI via the CMOC and will submit reports to NSLI via the CMOC demonstrating compliance and ensuring any required updates or corrective action is completed.

NSLI retains the overall responsibility for compliance, supported by the CMOC and the Contractor environmental staff.

During the construction and remedial works the Contractor(s) environmental team and its subcontractors will include specialists for the requisite monitoring including but not limited to Air Monitoring, Water Monitoring, Fisheries Monitoring, Wildlife Monitoring, and Archaeological Monitoring.

NSLI, in addition to the CMOC, will engage an Independent Monitor (IM) to provide technical support where required.

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Figure 3.2: Project Sub-Contracting Concept illustrates the main contractual relationships between NSLI, the CMOC, and the Contractor(s), as well as some of the activities to form portions of the work.

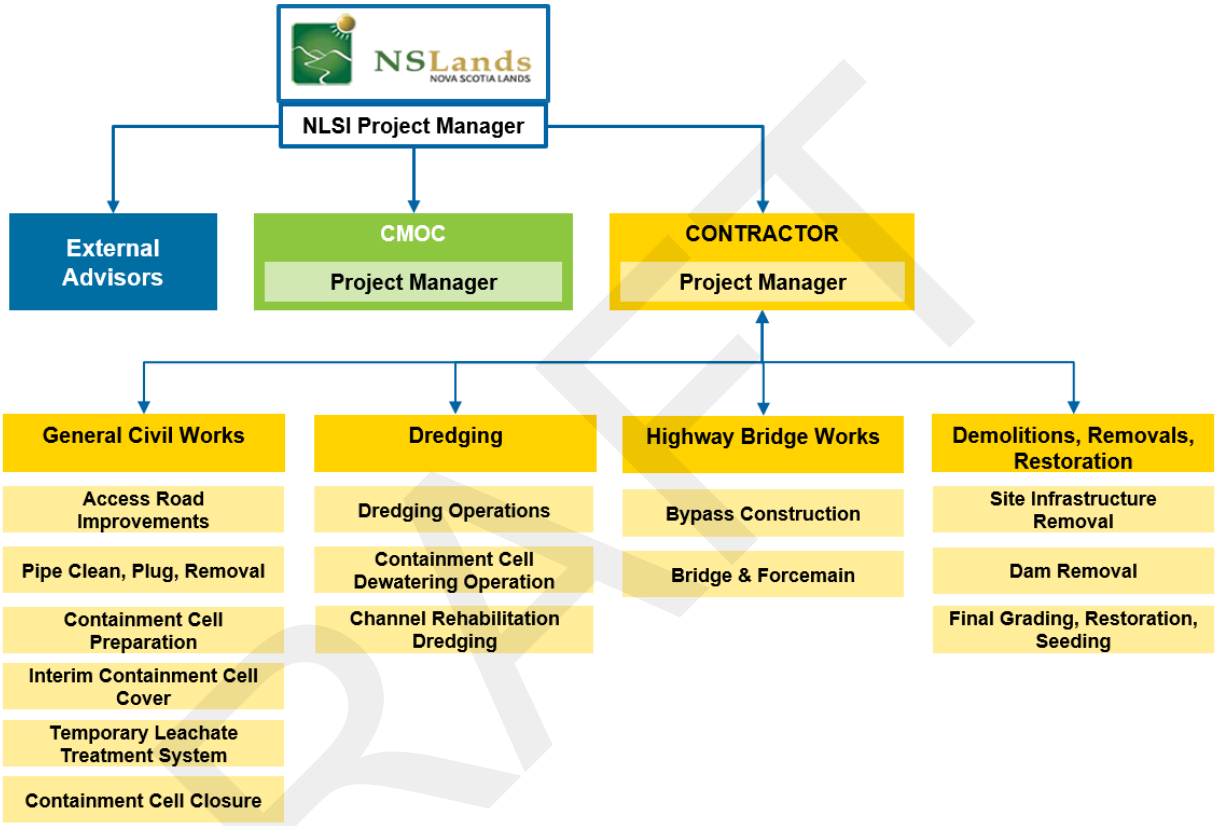

Figure 3.2 Project Sub-Contracting Concept

3.2 Nova Scotia Lands Inc./Proponent

NSLI is the Proponent for the BHRP and is a provincial crown corporation whose mandate is to access and, where required, remediate and redevelop crown owned properties. NSLI's portfolio includes a number of industrial parks in Cape Breton, Pictou County, and Queens County. NS Lands also has taken responsibility for remediation of a number of former industrial and mine sites throughout Nova Scotia. As the Proponent, NSLI is responsible for providing leadership to the Project and, among other things, for ensuring that the remediation project is carried out in a manner that protects human and ecological heath and the natural environment and implemented in compliance with all federal, provincial and municipal legislation.

3.3 Construction Management and Oversight Consultant

The CMOC is the front line contract interpreter and daily on site representative for NSLI. Responsibilities of the CMOC EM under the EMP include:

- Review EMP, PEPP and SSEPP amendment request in a timely manner

- Conduct a full review of the EMP and PEPP and revision requests on an annual basis to ensure that the recommended environmental protection procedures are current and complete
- Conduct compliance inspections to ensure requirements of the EMP and PEPP are being achieved
- Act as a liaison with regulatory authorities and NSLI for work activities
- Chair weekly meetings, prepare minutes, perform and report on quality audits

3.3.1 Training

The CMOC will be responsible for designating an on-site EM with knowledge of environment compliance and regulations. The CMOC EM, will be responsible for ensuring that all Contractor(s) and subcontractor(s) personnel are provided with Awareness Training on the EMP prior to work commencing. The Awareness Training serves to heighten the attentiveness of project personnel, including the Contractor(s) or their designated representative, regarding the environmental requirements and commitments associated with the Project. Awareness Training will include project-specific aspects outlined in this EMP, any conditions within the approvals received by NSLI, and other project-related permits prior to the initiation of work.

The CMOC EM will be responsible for confirming compliance with this requirement.

3.4 Contractor(s)

Contractor(s) working on the Site will be contractually responsible for implementing, enforcing and maintaining their activities in accordance with the EMP and PEPP associated SSEPPs for the duration of their contractual activities at the Site. The role of the Contractor(s) is to ensure works are completed in a manner that is compliant with the contract with regards to quality, safety, and environmental protection. Specifically. Each Contractor will complete daily and weekly inspection reports as required through the contract and plans.

3.4.1 EMP --Compliance Monitoring and Environmental Inspection

The Contractor EM will act as the EMP, PEPP and SSEPPs Coordinator. The Contractor EM will be responsible for inspection and monitoring of all applicable environmental protection measures, as well as any compliance monitoring until completion of the Project or such a time as all conditions are met. Monitoring frequency will be in accordance with the requirements as presented by NSLI in the Request for Proposal; environmental monitoring will be conducted for turbidity, noise, dust and air quality at a minimum, and any other parameters determined by regulatory agencies. Daily reports will be submitted to NSLI via the CMOC. The CMOC will provide review, auditing, and consolidation of reporting from the Contractor(s) EM and staff.

Responsibilities of the Contractor(s) EM will include:

- Offer necessary training for personnel, including Contractor(s), sub-contractors, to ensure proper implementation of the EMP, PEPP and SSEPPs
- Distribute copies of the EMP, PEPP and SSEPPs

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- Maintain an up-to-date lists of all EMP, PEPP and SSEPPs holders
- Keep a record of all EMP, PEPP and SSEPPs revision requires and present them to the CMOC
- Immediately forward addendums for approved EMP, PEPP and SSEPPs revision requests to affected holders

An example Environmental Site Inspection Checklist is appended to the PEPP. This checklist will be competed daily by the Contractor(s) personnel and submitted to NSLI via the CMOC on a weekly basis.

3.4.2 Training

Each Contractor will be responsible for ensuring that each new employee is provided with EMP Awareness Training by the CMOC EM prior to the commencement of work as outlined in Section 3.3.1.

In addition to the Awareness Training provided via the CMOC, all Contractor(s) working on the Site will be responsible for implementing, enforcing and maintaining their activities in accordance with the EMP and PEPP associated SSEPPs for the duration of their contractual activities at the Site, and for providing task-specific training requirements, information and BMPs to be incorporated into the SSEPPs.

3.5 External Advisors

3.5.1 Independent Monitors

In support of the overall Project, NSLI will retain the IM to provide the NSLI and the CMOC an audit function and advice as required.

NSLI will also retain an Independent Air Monitor to provide ongoing air monitoring to continue the ongoing monitoring of contaminants including both real-time and long-term monitoring including the operation of the Fixed Monitoring Station, as outlined in Table 8.1.

3.5.2 Boat Harbour Environmental Advisory Committee

A Boat Harbour Environmental Advisory Committee (BHEAC) has been established by NSLI to deal with strategies and plans for remediation planning from a science, technology and regulatory perspective.

The BHEAC is comprised of subject matter experts from several provincial and federal departments (including Health Canada, Environment and Climate Change Canada, Fisheries and Oceans Canada, Indigenous Services Canada, Transport Canada, Nova Scotia Environment, NS Lands and Forestry, and Nova Scotia Office of Aboriginal Affairs), academic experts from Dalhousie, Acadia, St. Francis Xavier and Cape Breton Universities, and Pictou Landing First Nation. The Terms of Reference (TOR) for the BHEAC were developed in January 2016 for the initial meeting of the committee. The TOR provides direction on the purpose of the BHEAC, its responsibilities, the reporting structure and lists the current representatives on the BHEAC.

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The purpose of the BHEAC, is to provide expert advice on the environmental management of the Project throughout the life of the Project to ensure that it is carried out in a manner that is environmentally acceptable and safe to human health. In this regard, the BHEAC responsibilities include advice on:

1. Scientific studies required to adequately prepare discrete or broad scope project descriptions as well as to adequately develop environmental effects monitoring.
2. Environmental monitoring programs, compliance monitoring, health and safety plans, contingency plans, environmental protection plans, emergency response plans, regulatory plans, compliance plans, etc.
3. Effectiveness of these plans throughout the life of the Project.
4. Progress in meeting Environmental Monitoring Plan and Environmental Effect Monitoring Plan requirements.
5. The mitigation of adverse environmental impacts.
6. Development and implementation of a follow-up program.
7. Opportunities for undergraduate/graduate studies in the engineering, environmental and social disciplines.-

3.5.3 Boat Harbour Clean-Up Committee and Community Liaison Coordinator

NSLI has established the Boat Harbour Clean-Up Committee (BHCC) to support PLFN inclusion and consideration in the development and implementation of remediation planning from environmental protection and human and ecological health perspectives. The BHCC includes members of NSLI, PLFN Council and community, and the Office of Aboriginal Affairs. -This Committee allows for timely and orderly exchange of information, views and concerns, allowing PLFN to understand, assess and respond to work on planning and engagement.

A PLFN Community Liaison Coordinator (CLC) was hired by PFLN and NSLI to support the committee and to give advice on public and community relations and manage and respond to community perspectives and expectations. Representatives of the Proponent, Nova Scotia Office of Aboriginal Affairs and PLFN participated in the hiring process leading to the appointment of the CLC.

4. Sequencing and Schedule

Sequencing and scheduling of construction activities are to follow BMP's for establishment of site controls and are to be completed in accordance with relevant permits and approvals. The schedule provided herein is a general guide to the ordering of activities and may be subject to change based on site conditions, timing of construction start, seasons and permits. Due to the large scale of the remediation efforts, these tasks are not strictly sequential and depending on nature of activity and current site conditions, multiple tasks may be carried out at the same time. A detailed schedule for all site activities is provided within the PEPP prepared under separate cover**.** The Contractor(s) will prepare a further detailed schedule for each project component, for review, approval of staging concepts, and progress monitoring to NSLI via the CMOC.

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The anticipated Project implementation schedule has an estimated duration between 4 and 7 years. The remedial works will be generally sequenced from upstream to downstream through the three phases of the Project.

4.1 Phase One – Site Preparation and Construction

To facilitate the extent of construction activities, multiple staging areas are required. Phase One of the construction sequencing will focus on establishing site controls and staging areas, including those used for equipment decontamination. Remediation of the existing infrastructure for sludge management (Settling Basins, effluent ditches and Containment Cell) will occur in preparation for the larger scale remediation, as well as improvements to the existing CC will be made in this phase. Activities specific to Phase One are outlined below:

- Site Preparation and Controls
- Pipeline Cleaning and SB Initial Remediation
- Ditch Remediation
- Water Level Controls Installation
- CC Modifications

4.2 Phase Two – Operation

Following the preparation of the SB to act as a stock pile location and the requisite improvements to the existing CC, dredging and remediation activities will commence. The site has been divided into separate sub-areas and will be dredged and remediated sequentially, starting with the wetland locations, followed by the Aeration Stabilization Basin, Boat Harbour Stabilization Lagoon, and then the estuary. For each area, the clean cattail tops will be removed and stored separately from the contaminated waste. The remaining sludge and cattail roots will be pumped into the Geotubes® within the improved CC.

On completion of the dredging works, an interim cover will be placed on the CC to allow for a period of settling and leachate drainage. The leachate removed from the cell during this period will be treated via a Temporary Leachate Treatment System (TLTS).

The Phase Two operation components include:

- Wetlands Remediation
- ASB Remediation
- BHSL Remediation
- Estuary Remediation
- CC Interim Closure
- Temporary Leachate Treatment
- Final Sedimentation Basin Remediation and Berm Removal

DRAFT

- Temporary Infrastructure Removal and BHETF Infrastructure Decommissioning
- CC Consolidation Period
- CC Operation and Maintenance and Final Closure

4.3 Phase Three – Decommissioning and Abandonment

The final phase will require the removal of the existing berms and the decommissioning of the effluent treatment facility buildings. The initial components of phase three overlap with the final stages of Phase Two. The removal of existing berms are considered part of phase three but will occur immediately prior to the placement of the CC interim closure.

Clean fill from the removed berms will be used on-site for general grading. Any contaminated soils from the berms will be placed within the improved CC. Once in-water remediation works and bridge construction is complete, the Dam separating Boat Harbour from the estuary will be removed. After consolidation (anticipated to be 1 year), the final cover will be installed on the CC and the TLTS dismantled and removed. The Phase Three decommissioning and abandonment components include:

- Causeway Removal and Bridge Construction
- Dam removal
- CC Closure and Post-Closure
- Landfill Gas Management

4.4 Post-Remediation

Post remediation includes the long-term monitoring plans, and the operation and maintenance of the CC, including hauling leachate in small quantities for off-site disposal. Post remediation components include:

- Landfill Gas Management
- Monitoring Programs
- Leachate Management, Cell Maintenance-

5. Management Plans

While the purpose of the EMP as a whole is to communicate to all project participants and stakeholders the commitment and efforts related to the prevention, management and minimization of potential environmental impacts during the implementation of remediation efforts, the purpose of the following Management Plans is to present the activities to be carried out along with commitments to strategies to ensure that the goals of the EMP are met. Management Plans outline specific areas of concern that are associated with both the project conditions and proposed remediation methods and presents both mitigation measures and programs to manage the associated environmental impacts.

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The following plans have been developed by NSLI to outline the Project-wide control measures associated with remediation activities.

5.1 Hazardous Materials Handling Plan

Site Preparation and Construction

During the majority of the on-land works, the storage and handling of hazardous materials will primarily apply to fuel and fluids servicing the heavy equipment (i.e., diesel fuel, oil). The Contract will include provisions in the General Conditions to hold the Contractor(s) to prohibit any contaminants, hazardous materials/wastes and solid wastes, whether pre-existing or otherwise, including, but not limited to, chemicals, fuels, lubricants, hydraulic fluids, calcium chloride, sewage, and water containing sediments and other deleterious, poisonous, toxic, hazardous, or oxygen demanding substances, to be released or further released into the environment, including any land, soil, sediment, streams, lakes, other surface waters, groundwater, and the atmosphere.

Specific accidental spill management plans included within the EMP are required to be submitted and approved to manage chemicals and fuels to be used on site. Submission of procedures for fueling and maintenance including for in-water equipment is required for approval by the CMOC. Adherence to the Petroleum Management Regulations (N.S. Reg. 44/2002) will be required for the storage of fuels or refueling on-site. Controls indicated in the overall site EMP include but are not limited to:

- When not in use, all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) will be securely controlled and locked-up to avoid vandalism and accidental spills.
- Materials will be stored in a dry location that is clean, and well-ventilated. Furthermore, hazardous materials will be stored on impermeable pads a minimum of 30 metres (m) from water or wetlands and handled in a manner which prevents release into the environment.
- No hazardous material or equipment containing hazardous material will be stored overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps to reduce the risk of flood.
- As required, all deleterious substances (including fuel, cleaners, solvents, paint, etc.) will be transferred at designated refuelling areas. Each deleterious substance will be established in a dedicated containment tray to prevent contamination of the Site in the event of a leak or spill during refuelling. Refuelling will occur with a containment tray in place, and a portable spill kit will be on hand.
- Where feasible, replace fluids with non-toxic bio-degradable fluids such as vegetable oil for hydraulic oil to reduce environmental impacts in the event of an accidental release (e.g., hydraulic line rupture).
- A refuelling plan and spill management plan will be developed for the refuelling of dredging related equipment while in or near the water.

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Operation

During operation, chemicals will be stored on site to support the dredging dewatering applications, and then in later stages to support the TLTS. These chemicals will be stored on based on detailed plans submitted by the Contractor(s) and approved by NSLI via the CMOC.

Chemical management plans will require, but are not limited to:

- The Contractor(s) must ensure that all areas and equipment with the potential to cause a leak or spill will have adequate protection and are stored in designated areas. This protection will include but is not limited to: spill containment systems for oils, fuels and chemical storage and transfer areas; spill containment systems under stationary equipment such as generators, pumps and compressors.
- Spill containment systems and drip trays will be impermeable and selected to allow full containment of spills and be able to handle the volumes expected from an accidental release. This includes being able to contain 125 percent of the liquid storage capacity of the equipment it is housing.
- The Contractor(s) will ensure that all staff are trained on recognizing and proper action to follow in the event of a spill. This will include spill source recognition, spill prevention techniques, spill containment, and proper spill reporting protocol. The spill response procedure will be posted and made available in the Site office trailer(s).
- The Contractor(s) will ensure that at least two spill response kits are kept and maintained on each active area of the Site. One spill kit must be in close proximity to working equipment that contains deleterious liquid such as hydraulic fluid or fuel. All staff will be informed on the location of spill kits and kits will be replenished in the event that the contents contained within are used. The spill kits shall be appropriate in content for the material that could be spilled on-site.

5.2 Waste Management Plan

Remediation of the BHETF will generate the following industrial solid waste streams:

- Sediment generated from cleaning of the pipelines; sediment waste from remediation of the SB, ASB, BHSL, wetlands, effluent ditches (current and historical); and the estuary.
- Impacted soil generated from decommissioning/demolition of the causeway at Highway 348, BHETF berms, dam, pipeline, and temporary by-pass.
- Construction and demolition waste
- Designated substances
- Industrial waste generated from remediation activities (e.g., spent treatment media).

Solid waste generated during remediation will be disposed of in the improved 6.7 ha CC. Vertical expansion of the CC will be required to accommodate the waste; and the CC will be further modified to enhance the base liner system and leachate collection system and facilitate placement and dewatering of the sludge/sediment in a one-step operation.

DRAFT

Final contours for the CC have been designed to accommodate the maximum vertical expansion with an increase in the perimeter berm height of up to 3.0 m, minimize precipitation infiltration through the cap, control the release of Landfill Gas (LFG), and accommodate end use.

Site Preparation and Construction

Prior to modifications of the existing CC, the current waste in the CC will be temporarily relocated either by pumping or by mechanically excavating and hauling to existing Site infrastructure (i.e., SB, ASB) or constructed staging areas. Dust emissions will be managed through the use of water or dust suppressants, where applicable and based on regulatory direction and approval. In addition, the internal roads may be paved to lower dust emissions.

The CC improvements will include removal of the existing overlying leachate collection infrastructure and exposure of the clay liner to install an engineered single composite liner system. A new geosynthetic clay liner (GCL) will be installed over the existing clay liner to replace the portion of removed clay and provide the liner system up the extended perimeter berms. A new Flexible Membrane Liner (FML) and a protective cover system consisting of a sand layer and geotextile will be installed over the GCL, followed by a leachate collection system consisting of leachate collection piping and a granular drainage layer overlaid with a geotextile over the cell composite liner system.

A below grade leachate storage tank will be constructed for the storage of leachate during the operational phase of the Project and will form part of the long-term leachate management system post-closure. The stormwater management pond will also be constructed for use during the operational phase as an emergency holding basin and will form part of the long-term stormwater management system post-closure.

Operation

The dredged sediment will be pumped into Geotubes® located in the CC and dewatered by gravity over time. Other wastes generated through the Project such as impacted soil will be used to fill the voids between the Geotubes® and shape the cell, as available. Mechanically excavated sludge (e.g., sludge from the edges of BHSL, SB, and ditches) will be managed through a combination of slurrying and pumping or loading in a dump truck and end dumping into the CC.

Dewatering Effluent

Dewatering effluent from Geotubes® will be collected and conveyed to Boat Harbour, as described in Section 5.5 Water Management Plan.

Surface Water Management

During remediation, clean surface water runoff in the vicinity of the CC will continue to be diverted away from the CC and controlled by infiltration and overland flow. Water that comes in contact with the waste will be managed as leachate and conveyed with the dewatering effluent to Boat Harbour.

The proposed location of the stormwater management pond is in the location of the existing overflow pond area. The upgraded stormwater management pond outlet structure will include a discharge control valve operated in the normally open position. This valve can be closed to prevent discharge in the event of a spill and during the operational phase as well as post-closure.

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Decommissioning and Abandonment

CC Closure and Post-Closure

The decommissioning and abandonment phase for the CC is referred to as 'closure and post-closure' as it is more appropriate for describing the end of operation life for CC. The CC will not be decommissioned (i.e., withdrawn from service), it will be capped and waste will be continued to be stored within it. After the CC is capped and closed, on-going monitoring and maintenance (long-term) will occur.

Post-closure leachate will be managed though off-site disposal as described in Section 5.5 below. Once active remediation is complete, a TLTS will treat leachate from the CC for the transition period between securing dredging operations and settlement and consolidation, when higher flows are anticipated. Leachate management long-term will involve off-site disposal, using the installed leachate holding tank and truck loading station. Details on TLTS and long-term leachate management are described in Section 5.5 below.

Final cover will be placed once the waste within the CC has stabilized. The final cover will consist of a sand/grading layer, FML, sand drainage layer, and vegetated topsoil constructed to minimize infiltration and reduce leachate generation. The final cover material will be designed to accommodate intended plantings such as short shrubs that will tie the CC visually into the surrounding tree line. As part of final cover construction, leachate monitoring wells and passive gas vents will be installed. A digital rendering of the proposed final CC (with the stormwater pond and leachate loading station in the foreground) is shown in Figure 5.2: Digital Rendering of the Proposed Final Containment Cell.

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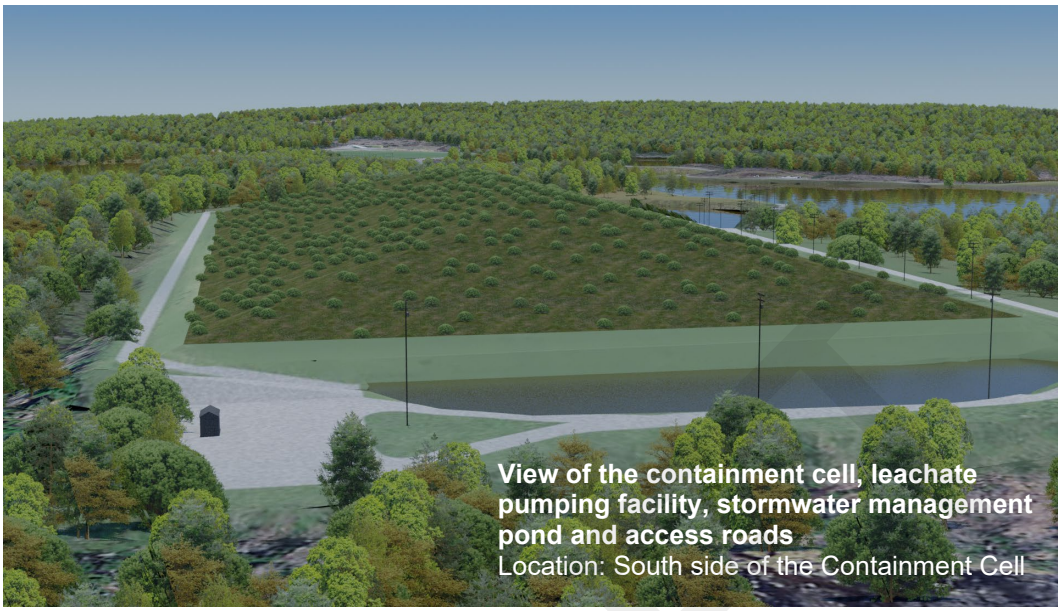

Figure 5.1 Digital Rendering of the Proposed Final Containment Cell

Landfill Gas Management

LFG is produced by the biological decomposition of waste placed in a landfill. LFG will be managed using a passive venting system (constructed as part of the final cover system) which allows the release of pressure build up within the closed cell.

5.3 Dredging Management Plan

Site preparation and construction will include installation of silt curtains, dredging anchor points, Geotubes®, and the slurry dosing system. Construction will include the water level control structure at the causeway, which will be used to adjust the BHSL water level as needed for dredging and to prevent discharge of water that is not in compliance with the discharge criteria. For sludge removal within the impacted wetlands and potentially areas of BHSL, temporary access points will be constructed off of the existing Site access roads.

Remediation of the BHETF will include dredging of the ASB, BHSL, wetlands, and estuary. General layout and staging of these works are outlined in the drawings included in Appendix A. Dredging will be completed in the wet, predominantly via hydraulic dredge. The shorelines of the ASB, BHSL, wetlands and estuary, and the SB, and effluent ditches (current and historical) will be mechanically excavated. Dredged sludge slurry will be pumped through discharge lines to the Geotubes® located in the CC, where it will dewater by gravity.

Site Preparation and Construction

Site preparation and construction will include installation of silt curtains, dredging anchor points, Geotubes®, and the slurry dosing system. Construction will include the water level control structure at the causeway, which will be used to adjust the BHSL water level as needed for dredging and to prevent discharge of water that is not in compliance with the discharge criteria. For sludge removal within the impacted wetlands and potentially areas of BHSL, temporary access points will be constructed off of the existing Site access roads.

Operation

Ditches and Initial Settling Basin Remediation

During this initial remediation stage, the pipeline will have been cleaned and decommissioned, but the CC improvements will not yet be completed. As such, one of the SB and/or the ASB will be used as a temporary CC area at this time. These initial remedial works consist of the following:

- Dewatering of the SB through existing decant structures.
- Disconnecting/blocking flow from SB to the ASB.
- Excavation of sludge/contaminated sediment in the effluent ditches.
- Backfilling ditches to match adjacent grades with clean fill, followed by placement of topsoil and seeding and erosion control measures as needed.
- Excavation of residual impacted soil/sludge within one of the SB.

Dewatered Sludge from Pilot Scale Testing Relocation

Once the CC improvements have been made, the sludge contained within Geotubes® at the Pilot Scale Testing Treatment Pad will be hauled by trucks to the CC for bulk disposal.

Wetlands/Estuary Remediation

The wetlands areas for which active remediation has been deemed necessary through the risk assessment, will be remediated through a mix of hydraulic and mechanical dredging. The vegetation where required, will be excavated and the sludge will be hydraulically dredged and pumped to the Geotubes® for dewatering or mechanically excavated and hauled to the CC for bulk disposal and gravity dewatering. The removed and euthanizing of fish as required will be completed in a culturally sensitive manner that will be determined in consultation with PLFN and in accordance with authorization from DFO and the conditions of approval.

ASB Remediation

All equipment located within the ASB will be decommissioned and removed prior to remediation of the ASB. Impacted sludge/sediments from the ASB will be hydraulically dredged and conveyed to the Geotubes® located within the CC for dewatering and disposal.

Boat Harbour Stabilization Lagoon Remediation

Impacted sediment/sludge in BHSL will primarily be hydraulically dredged and conveyed to the Geotubes® located within the CC for dewatering and disposal. Mechanical dredging may be employed as needed in shallower areas at the edges of BHSL. BHSL will be dredged in sub-areas divided by silt curtains.

During dredging, the active area or downstream areas of BHSL will receive the pre-treated dewatering effluent from the CC. Once returned to BHSL, the effluent will undergo additional treatment through natural attenuation processes. The water level control structure at the causeway will provide the ability to hold water in BHSL should the water quality exceed discharge criteria. The detailed design of the control structure will be prepared by the Contractor(s), but the performance requirement set as part of the EIS is the ability to raise and lower the water level in 150 millimetres

DRAFT

(mm) increments. In the event of a failure of the primary and secondary means of turbidity containment (dual silt curtain system), the water level control structure can be raised to provide several days of storage at average flow, which will permit the silt to settle and testing to be completed prior to release of any potentially impacted bulk water.

Settling Basins Final Remediation

Prior to final remediation of the SB, any residual sludge and contaminated soil will be hauled to the CC for bulk disposal. The SB will be filled with clean fill and graded to maintain positive drainage, followed by placement of topsoil and seed, and erosion controls.

QA/QC Program for Dredging

Site quality control will take place during dredging by the Contractor(s). Sludge/sediment samples will be taken from the bottom of the area undergoing active dredging. The samples will allow for identification of the extent of dredging remediation via qualitative comparison of sludge samples versus known characteristics of impacted sludge/sediment and native marine sediment.

The CMOC will confirm that dredging has been completed to the target evaluation. Following dredging to the target elevation, a sediment sampling program will be implemented to confirm that the bottom surface meets the proposed end-point criteria/site specific target levels (SSTLs) for the contaminants of potential concern (COPC). Surface-weighted average concentrations, also referred to as spatially-weighted average concentrations, or SWACs, is the method proposed for determining if the SSTL (or remedial objective) has been achieved following completion of the remedial activities.

Table 5.1 Final Calculated SSTL from HHERA

Medium	COPC	Sediment SSTL
Sediment	Vanadium	49 mg/kg
	Dioxin and Furan Total Equivalent	29 pg/g

In areas that do not meet the remediation criteria a second dredging pass will be conducted followed by confirmatory sampling. This process will be repeated until the remediation criteria has been met in all areas.

The use of silt curtains will help reduce the migration of suspended sludge to remediated areas.--

5.4 Wetland Management Plan

The wetlands, BHSL, and the estuary have undergone a risk-based remedial approach. The risk-based approach is a scientific method widely accepted by regulators to evaluate potential environmental impacts and to estimate if these impacts are likely to cause adverse health effects to humans or ecological receptors. The risk assessment process requires thorough evaluation of potential contaminants associated with a specific site or property, identification of human and ecological receptors that may use the property, and ways these receptors may be exposed to potential contaminants (e.g., direct exposure to soil, consumption of plants/wildlife, consumption of water, etc.).

Ex-Situ remediation of portions of the wetland, all of BHSL and a portion of the estuary will require active remediation through dredging in the wet with Geotube® dewatering. The interpreted horizontal

limit of wetlands and estuary requiring remediation is shown in detail on the Contract Drawings, and in overview on the Supporting Drawings for General Staging included in Appendix A.

Site Preparation and Construction

Construction of access roads will be required to facilitate dewatering and removal activities prior to remediation. Details for road improvements are included in the Contract Drawings, and an overview is included in the Supporting Drawings for General Staging included in Appendix A.

Operation

Cattails and other organic material will be removed from the wetlands through clearing and grubbing activities. The material will be mechanically processed through chipping and grinding and stockpiled for future use as mulch/soil amendment. The impacted sediment in the wetlands will be hydraulically and/or mechanically dredged and conveyed to the Geotubes® located within the CC for dewatering and disposal.

In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health.

Following dredging to the target elevation, a sediment sampling program will be implemented to confirm that the bottom surface is in compliance with the remediation criteria. In areas that do not meet the remediation criteria a second dredging pass will be conducted followed by confirmatory sampling. This process will be repeated until the remediation criteria has been met in all areas.

Decommissioning and Abandonment

Once the wetlands are remediated, the reestablishment of vegetation and wetland function will start to occur before Boat Harbour is returned to tidal conditions. The remediation phase will include, in addition to the infilling and regrading of wetlands, planting or seeding of native aquatic and terrestrial vegetation along the affected shorelines in the construction areas only.

Upon the completion of remediation activities and the decommissioning of the BHSL dam, the disturbed areas along the shoreline will be restored with plantings and re-seeding with hydraulic seed mix suited to low-lying wetlands, consisting of native-invasive species. Higher areas away from shoreline and remediated access road and work areas will be mechanically seeded, including addition of native species of trees and shrubs to better promote a mix of vegetation matching surrounding areas. Planting, seeding, and other wetland restoration operations may also be carried out.

5.5 Water Management Plan

5.5.1 Bulk Water Management

The term bulk water management refers to impacted surface water and groundwater that needs to be managed prior to, during, or post sludge/sediment removal, and excludes leachate from sludge/sediment treatment processes (i.e., discharges from the CC following cessation of dredging operations). The BHSL continuously receives surface water flow from the collection area surrounding the harbour. In addition to surface water drainage, the BHSL also receives continuous influence from groundwater. The compound flow of surface water drainage and groundwater

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infiltration into the BHSL is estimated to range from 7,200 (low) to 64,000 cubic metres/day (m^3/day) (peak) and a 28,000 m^3/day (average) flow. Thus, the BHSL will be continuously flushed with water of quality equal to natural background condition in the area of Boat Harbour.

Management of bulk water during active remediation of the BHETF is by the use of silt curtains to prevent migration or transport of sediment from within the active work area(s).

5.5.2 Dewatering Effluent Management

Dewatering effluent is water generated from dewatering sludge/sediment using Geotubes® or its equivalent and effluent from the CC which has come in contact with waste. Geotube® dewatering operations will occur within the CC. Geotube® effluent will be collected and directed by discharge piping back to the BHSL in the areas being dredged, or into an area that has not been remediated. Through Geotube® dewatering, the effluent is pre-treated through chemical dosing and Geotube® filtration. The dewatering effluent then mixes with the bulk water and is further managed through the use of silt curtains.

Dewatering effluent is water generated from dewatering sludge/sediment using Geotubes® and effluent from the CC which has come in contact with waste. A slurry at a 3 to 5 percent solids concentration is expected to be pumped to the Geotubes® established in the existing CC yielding approximately 5,200,000 cubic metres (m^3) of dewatering effluent during dredging. Dredging will be executed at a rate of approximately 4,000 m^3/day of in-place material. Geotube® dewatering operations will occur within the CC. Geotube® effluent will be collected and directed by discharge piping back to the BHSL in the areas being dredged, or into an area that has not been remediated. Through Geotube® dewatering the effluent is pre-treated through chemical dosing and Geotube® filtration. The dewatering effluent then mixes with the bulk water and is managed through natural attenuation. Because the dredging operation results in recycling of the BH water, and because the returning water has potential for carry-over over some constituents, the Contract requirements include monitoring of the dewatering effluent for parameters of concern, as well as placing limits on the returning water volume to reduce potential for build up to undesirable levels.

5.5.3 Leachate and Containment Cell Water Management

All water that comes in contact with the waste material that is dredged will be managed as leachate. During the interim period, leachate will be directed from the CC to the permanent leachate holding tank located in the area immediately east of the CC. From the holding tank, the leachate will be conveyed to a TLTS configured in the same area. Treated effluent from the TLTS that meets the appropriate discharge criteria will be conveyed to the discharge point of the BHSL to the estuary. It is expected that the TLTS will be required for approximately 1-2 years following cessation of dredging operations and for a few months following placement of final cover and closure of the CC.

Under post-closure conditions, the anticipated leachate generation rate from the CC is expected to be less than 2,500 m^3 per year (≤7.0 m^3/day), decreasing over time. In this post closure period, the TLTS will no longer be employed and will be removed. Leachate collected within the CC will be directed (pumped) to a 40 m^3 buried holding tank. Stored leachate will be pumped from the holding tank to tanker trucks and taken off-site.

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Immediately following cessation of dredging operations, an interim period of time will occur between the completion of dredging (when the CC is uncovered or under interim cover), through progressive and final complete cover/closure of the CC. During this interim period, the waste within the CC will continue to release water as the solids thicken and consolidate. An interim cover will be placed over the CC during this period to reduce the amount of precipitation that comes in contact with the waste and thereby reduce the quantity of impacted water required to be managed. All water that comes in contact with the waste during this period will be managed as leachate. During the interim period, leachate will be directed from the CC to a TLTS configured in the area immediately east of the CC. The TLTS will be configured as multiple parallel treatment trains, sized to manage an average flow of 200 m^3/day, providing treatment for flows up to a peak of 1,000 $m^{3/}$day. All solid residuals resulting from temporary leachate treatment will be disposed of in the CC (prior to the placement of final cover on the cell, if practical) and off-site following placement of final cover and closure of the CC. Treated effluent from the TLTS that meets the appropriate discharge criteria will be conveyed to the discharge point of the BHSL to the estuary. Effluent from the TLTS that does not meet the criteria, if any, will be recirculated and retreated. Long-term leachate will be managed through off-site disposal. It is expected that the TLTS will be required for approximately 1-2 years following cessation of dredging operations and for a few months following placement of final cover and closure of the CC.

Under post-closure conditions (i.e., after capping the CC with a low permeable final cover), the anticipated leachate generation rate from the CC is expected to be less than 2,500 m^3 per year (≤7.0 m^3/day), decreasing over time. In this post closure period, the TLTS will no longer be employed. All TLTS components will be demobilized from the Site. Leachate collected within the CC will be directed (pumped) to a 40 m^3 buried holding tank. Stored leachate will be pumped from the holding tank to tanker trucks (ranging in size from approximately 10-40 m^3). Loading of the trucks for off-site disposal will be achieved by two (lead-lag) self-priming leachate loading pumps. The leachate loading station will include a load-out billing station for verification of the volumes and hauler removing leachate from the Site. The leachate loading pumps and associated electrical/control hardware associated with the leachate loading station will be configured in a pump house located adjacent to the buried leachate holding tank. Upgrades to access roads in the vicinity of the CC will permit truck access to the temporary leachate treatment equipment staging area and leachate loading station

5.5.4 Management of Watercourses during Construction

A total of 19 watercourses on the Site have been identified: two ephemeral channels, 13 intermittent channels, three small permanent channels, and one large permanent channel. Three small drainage corridors were also identified. Management of watercourses for each element differs depending on where the watercourse is located relative to the other activities occurring on Site.

In general, the nature of the works and the construction methods are such that the watercourses will not require separate management. Flow from watercourses into the active in-water work areas will continue, with the management practices for bulk water allowing for this through-flow. In most other cases, a simple diversion into the wetlands areas will be implemented. In other cases, a pump around the active portion of the construction site will be implemented. Regardless of method and whether it will be a temporary or permanent removal of surface and/or groundwater, all site-specific requirements identified in the construction plans, conditions of the DFO work permits and all erosion

DRAFT

and sediment control measures shall be implemented by the Contractor(s) and monitored. Surface and groundwater construction waters coming into contact with waste will be managed as part of the dewatering effluent in accordance with site specific plans based on contractor finalized layout and staging plans.

5.5.5 Compliance under Federal Fisheries Act

5.5.5.1 Marine Environment

Remediation activities will result in a positive long-term effect to habitat quality through removal of contaminated sediments in the estuary. There will also be a positive impact to the marine environment, once the Dam has been removed, as the reintroduction of tidal influence will result in the accessibility of several hundred hectares of habitat to anadromous fish species and other marine organisms.

The key potential adverse effects resulting from the Project on the marine environment are an increased disturbance to the marine environment from heavy machinery operation in and around the estuary, the release of contaminants that have been historically contained in sediments during the wetland remediation process, and removal of marine vegetation resulting in loss of aquatic habitat during dredging of the estuary and removal of the dam.

Mitigation measures that will be implemented to address potential adverse effects to the marine environment include, but are not limited to, the following:

- Educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas.
- Ensure care is taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat. No herbicides shall be used near possible fish habitat.
- Ensure proper Erosion and Sediment Control (ESC) Plans are in place prior to the removal of the dam control structure.
- Ensure that the Spill Management Plan (SMP) is in effect and its procedures fully communicated to staff to protect the marine environment from accidental spills.

5.5.5.2 Fish and Aquatic Habitat

Other than the positive effects on fish and aquatic life resulting from the Project, the adverse effects resulting from the Project on fish and aquatic habitat are the direct destruction of fish during the removal of impacted sediments, the disturbance, alteration and loss of aquatic habitat, and the suspension of impacted sediments which will increase levels of Total Suspended Solids (TSS), Total Dissolved Solids (TDS), and turbidity. There will also be some fluctuation of surface water volume (within existing high water levels) when the flow control structure is utilized and eventually removed.

Mitigation measures that will be implemented to address potential adverse effects to the fish and aquatic habitat include, but are not limited to, the following:

- Adhere to surface water alteration permits and timing windows for work activities.
- Ensure care is taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat. No herbicides shall be used near possible fish habitat.

DRAFT

- Ensure ESC Plan and SMP measures are in place.
- Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities by restoring Boat Harbour into an estuary, subject to DFO direction and approval.

While the Project will disturb these sediments, and cause localized siltation during the remediation process, the fish habitat will improve significantly when remediation is complete.-

Construction Activities

During the dredging of the estuary, pumping, removal of causeway and dam, there is the potential to directly injure or kill fish with machinery (i.e., pumps), or to indirectly injure them through smothering with excess sediment laden water.

To minimize potential fisheries impacts and water quality impacts during construction, all site-specific requirements identified in the construction plans, conditions of the DFO work permits and procedures in the ESC Plan procedures shall be followed. In addition, excess material, fuels, controlled materials and construction debris, shall be stored at the temporary material storage pad area or in a designated area on gradients that will allow a spill to easily enter a watercourse.

All fish management work will be guided by fisheries specialists retained by the Contractor(s) to remove as many fish from the construction areas as possible. The Contractor(s) under the guidance of a fisheries specialist, shall follow the subsequent procedures to remove fish from the construction as described within the PEPP.

5.5.6 Groundwater

The key potential effects resulting from the Project on groundwater include the contamination of groundwater from a spill/release of leachate, and construction and dredging activities.

Mitigation measures that will be implemented to address potential adverse effects to groundwater include, but are not limited to, the following:

- Ensure SMP is in place.
- Monitor perimeter groundwater wells for contaminants of concern (COC).
- Construct a leachate holding tank with appropriate seals and construct spill containment pad in case of spill while pumping from the holding tank to tanker truck to haul leachate off-site.
- Monitor and maintain leachate collection system within the CC.
- Reduce interaction between surface water and groundwater by implementing surface water control measures.

The potential effects are mainly short-term in nature and confined to the Site.

5.5.7 Surface Water

The key potential effects resulting from the Project on surface water include the effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity. In

DRAFT

addition, a potential leachate spill or the release of petroleum products has the potential to result in surface water impacts; however, a potential spill or release is not considered likely.

Surface water runoff will be managed by the installation of silt curtains to control sedimentation and through the installation of specific diversion control structures such as berms or ditches. The effluent discharge to the estuary will be monitored at the outlet structure to ensure compliance with the TSS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 milligrams/Litre [mg/L]) from background level). In the event of a failure of containment of turbidity, the water level control structure level can be raised to provide several days storage to permit settlement of turbidity and re-testing.

Mitigation measures that will be implemented to address potential adverse effects to surface water include, but are not limited to, the following:

- Maintain existing vegetative cover whenever possible, minimize overall areas of disturbance; and minimize travel across areas of exposed soil.
- Ensure SMP is implemented.
- Implement specific diversion control measures prior to and maintain during construction activities. Measures shall not be removed until all areas have been sufficiently stabilized. The removal of control measures will only be undertaken on the authorization of the Contractor(s) EM, with the concurrence of the CMOC EM, once environmental inspections have confirmed that the erosion and sedimentation and contamination control performance objectives have been met.

5.6 Transportation Management Plan

The preparatory work, construction activities and post-construction work will require the use of personal transportation vehicles and the intensive use of heavy construction vehicles, both on and off-site. The use of transportation machineries will result in an extra traffic to local roadways, noise, diesel and other exhaust emissions and airborne Particulate Matter (PM) in the form of dust.

As such, the purpose of the Transportation Management Plan (TMP) is to establish controls that will mitigate these impacts Site-wide and to the surrounding area prior to the commencement of construction activities. Key areas for traffic management will be at the entrance to Simpson Road and onto Highway 348 on the east side of the Site, and the bridge works on Highway 348 at the northwest of the Site. Priority at the Simpsons Road access should be given to residents, and construction traffic management must emphasize safety and minimize disruption. Construction of the Highway 348 Bridge will require submission of a TMP that demonstrates strict compliance with Nova Scotia Transportation and Infrastructure Renewal (NS TIR) guidelines and the Contractor(s) will be responsible for obtaining the requisite permits from NS TIR.

5.7 Light Management Plan

The use of lights will be limited to the amount necessary to ensure safe operation during remediation works, with the recognition that excessive lighting can be disruptive to wild species.

Mitigation measures that will be implemented to address potential effects to light will include, but are not limited to, the following:

DRAFT

- Install downward-facing lights for on-site infrastructure and Site roads.
- Install, wherever possible, motion-sensors to ensure lights are not turned on when they are not necessary.
- Only direct and focused light will be used for worker safety.

Once the mitigation measures are taken into account, the residual effect of temporary elevation of light in the area is not significant---.

Bird collisions with Project lighting and subsequent mortality are expected to be rare but if it occurs, it will not likely have significant effects on migrating bird populations. Efforts will be made to reduce the effect of lighting on migrating birds.

5.8 Bridge at Highway 348

Currently a causeway along Highway 348 crosses the downstream end of Boat Harbour. The causeway will be demolished/decommissioned using mechanical means and replaced with a concrete girder bridge along the same alignment to return Boat Harbour to tidal conditions and to allow for boat access to the harbour. The conceptual view of the bridge from the estuary water side is shown in Figure 5.2: Digital Rendering of the Proposed Bridge (South View).

Figure 5.2 Digital Rendering of the Proposed Bridge (South View)

Site Preparation and Construction

The bridge will be constructed prior to dam decommissioning to allow sediment to be managed within Boat Harbour and prevent its migration downstream to the estuary or Northumberland Strait.

A water main, constructed within the existing Highway 348 causeway embankment and provides water supply from the nearby well field to PLFN. Prior to construction, a temporary single lane by-pass (causeway) will be constructed on the north side of the existing causeway (between the dam and the causeway) to facilitate traffic flow during bridge construction and a temporary water main and will be overland along the edge of the temporary by-pass. The design of the new bridge will incorporate a new support system for the water main.

Operation

With regular maintenance and scheduled inspection, the bridge is anticipated to be capable of service up to and beyond its design life of 75 years.

Decommissioning and Abandonment

Once the bridge becomes operational it will become the responsibility of NS TIR.

5.9 Infrastructure Decommissioning

5.9.1 Decommissioning Pipeline

The pipeline consists of approximately 2,305 m of 0.915 m diameter fiberglass reinforced plastic pipe buried on land (starting at a standpipe adjacent to the Mill property and running to the East River and emerging at Indian Cross Point then running under Highway 348 to the first BHETF open draining ditch) and approximately 1,220 m of 1.1 m diameter high density polyethylene pipe buried below the East River.

At the direction of Nova Scotia Environment (NSE), the previous owners have cleaned and inspected the pipeline and confirmed that no effluent remains, and only 10 percent gravel remains in low portions of the pipeline that will not be removed. Therefore, no activities as part of this Project are required for the decommissioning of the pipeline sections that will be abandoned in place (i.e., no further cleaning or inspection will be completed.

The under water portions of the pipeline will be abandoned in place. The section of pipeline on land from the shoreline of Indian Cross Point east up to the Highway 348 property line, adjacent to a historic Mi'kmaq burial ground will be removed completely, as requested by PLFN.

The portion of the on land pipeline that goes under Highway 348 has been severed, filled, and capped by Nova Scotia Department of Transportation and Infrastructure Renewal (NSTIR). The rest of the on-land pipeline will be abandoned in place.

Site Preparation and Construction

There is no site preparation and construction phase for the decommissioning of the on land pipeline and under water pipeline.

Operation

There is no operation phase associated with infrastructure decommissioning.

Decommissioning and Abandonment

The section of pipeline on land from the shoreline of Indian Cross Point east up to the Highway 348 property line, adjacent to a historic Mi'kmaq burial ground will be removed completely, as requested by PLFN. This will require clearing and grubbing within the existing pipeline easement prior to excavation and removal. Archaeological monitoring will be conducted with permits being obtain by the GC.

The portion of the on land pipeline that goes under Highway 348 has been filled with non-toxic polymer foam. The rest of the on land pipeline east of the highway will be abandoned in place. Abandonment of the rest of the portions of the on land pipeline and the underwater pipeline will consist of leaving the pipeline in place. The ends of the pipeline will be plugged with an appropriate cap (e.g., concrete or bentonite plug). Each maintenance hole (MH) will be cut approximately 1 m below ground surface (mbgs) and backfilled (both remaining void space within the MH and disturbed

DRAFT

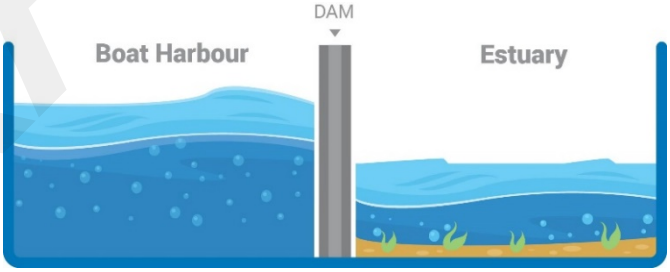
area). Disturbed areas will be graded to match existing hard surfaces and to achieve positive drainage.

5.9.2 Treatment Buildings

Numerous treatment buildings, as well as small structures, (including Mobile Building Adjacent to Press Building; Storage Shed; Air Monitoring Shelter; Mobile Building belonging to CTS Electrical; Silo and Electrical Building; Point A Building; and Point C Building), were part of the BHETF. Treatment buildings and smaller infrastructure will undergo a chemical sweep, cleaning, designated substance removal (if any), followed by demolition using mechanical means. Footing and foundations will be cut and buried. Only above-grade structures will be removed. The remedial approach consists of decommissioning and demolishing each building/structure and transporting waste materials for disposal or recycling. If an end use is identified for a building it will undergo inspection and repurposing.

5.9.3 Dam

The dam is used to regulate the water level in the BHSL and is located north of the causeway at Highway 348 at the mouth of the estuary (Figure 1.1). The dam is a flat concrete slab structure with retaining walls supporting the earth embankments at both ends, the bottom elevation of the slab is approximately at minus 0.92 m above mean sea level (mAMSL)[1] which is about the equivalent of low tide. The water levels are controlled by an adjustable weir/stop log arrangement within the dam structure. Under current operations, salt water intrusion of Boat Harbour occurs during high tide situations.



At completion of remediation activities within Boat Harbour, the remedial approach involves the demolition of the dam structure, stabilization of the estuary embankment slopes and dredging of the channel to ensure the hydraulics are maintained throughout the channel. Access to the location point for dredging of the channel will require the widening of an existing unmaintained road and establishment of a staging area.

Decommissioning and Abandonment

The demolition of the dam structure will consist of using mechanical equipment to break the concrete structure into smaller components to be excavated and dumped into a dump truck for off-site disposal at a construction and demolition facility licensed to accept the waste/recyclable materials The smaller elements of the structure will be demolished by hand, such as the timber screens and fences. The earthen berm connecting the dam to the banks will also be removed, as needed, to facilitate boat access to Boat Harbour and to return the river to a more visually natural state.

Demolition will commence once the remediation and dredging work is essentially complete and Boat Harbour is ready to be reinstated back to tidal conditions. Once the dam structure is removed,

[1] Average Mean Sea Level (AMSL); Based on CGVD26 Datum

the channel will be dredged to match the channel shape and depth of the bridge (that will be installed to replace the causeway) to ensure the hydraulics are maintained throughout the channel.

5.10 Remediation Infrastructure

In order to facilitate the proposed remedial works described in the preceding subsections, additional Site infrastructure will be required.

Water Supply (Industrial and Drinking)

Drinking Water

The existing water wells on-site associated with the BHETF will be decommissioned.

Construction activities will not require potable water, except for consumption by staff. The quantity of drinking water required on-site during construction will vary based on the size of the construction crew during the various phases of the Project. Potable water for staff will be imported to Site by the Contractor(s) as required to service staff needs.

PLFN Water Supply

The proposed bridge is designed to accommodate the potable water supply line from PLFN Well Field to the community, in accordance with potable water guidelines (Atlantic Canada Guidelines for Drinking Water Supply Systems). Temporary water supply service is required during causeway removal and bridge construction activities. Upon completion of bridge construction, permanent water supply services will be reinstated. Permanent water supply services will be conveyed by a pipeline suspended from the bridge and will require continual electric power source/supply for heat tracing.

Industrial Water

Industrial water is not required on-site. Instead, Boat Harbour water will be recycled and used for polymer preparation for treatment process. Dredging operations will be recycling water from and back to Boat Harbour at a rate estimated to be 12,000 m^3/day. Water for polymer preparation to support the dredging will amount to an estimated additional flow of up to 1,200 m^3/day, but depending on selected dosing rates could be much lower. It should be noted that all water noted here is recycled flows, so there is no net change to amount drawing from Boat Harbour.

After securing dredging operations, Boat Harbour water will be used for polymer preparation for the TLTS, during the stage after dredging and prior to capping of the CC. During the TLTS operation, treated effluent water is anticipated to be an average of 200 m^3/day. This water is largely recycled back to Boat Harbour, with the exception of settled solids from the treatment process.

Site Access

The Site has an existing access road (Simpsons Road) that extends from Pictou Landing Road/Highway 348 to the berm separating the ASB from BHSL.

Access to the CC is via a single lane gravel roadway off the perimeter road along the southern bank of the ASB. Vehicle access to the CC will be upgraded to facilitate cell improvements, waste placement, construction of final cover, and post-closure monitoring and care including leachate

DRAFT

management. As such, the existing access road will be realigned and widened to facilitate vehicle access.

Construction of temporary access roads into the wetlands to facilitate dewatering and removal activities will also be required. These access points will utilize previously disturbed areas wherever possible and where not possible strict environmental protective measures will be put in place and monitored daily.

Permanent and Temporary Linear Infrastructure

Temporary linear infrastructure includes floating pipelines, booster pumping station, temporary power supply to several areas around the Site, wash down areas, and road improvements across existing berms. These components will be removed on conclusion of the works and any disturbed areas stabilized prior to demobilization from the Site.

Energy Supply

In the earliest stages of the Project the energy supply to the Site on the west side will be improved and extended to the CC. This extension is required to permanently power the leachate collection system and truck loading station. This same line will be used for temporary power supply to construction trailers and water management pumps in the CC area in order to minimize impact to the surrounding area.

Power currently available at the plant building and in the vicinity of the Pilot Treatment Pad, may be used during construction for temporary facilities, but will be decommissioned as part of the remediation works.

The dredging operations will require power for both dredge operation and pumping of dredged material to the CC. These systems will be diesel powered, as they are typically required to be mounted on floating equipment/barges.

5.11 Human Health and Ecological Risk Management Plan

Options for limiting the potential unacceptable risk from Dioxin/Furan Total Equivalency Factor (D/F TEQ) in sediment include institutional control, removal, or cover. To determine the areas that require risk management/remediation, SSTLs were calculated to be protective of the PLFN resident/recreational user from direct contact with sediment. The most conservative of the sediment SSTLs for the four exposure scenarios evaluated was direct sediment contact/ingestion in future intertidal mudflats (assumed following removal of the Highway 348 causeway/dam structure).

6. Potential Environmental Impacts & Mitigation Measures

6.1 Air Quality

The key potential effects resulting from the Project on air quality include temporary elevated emissions of particulate matter resulting from construction activities. This is as a result of an increase in odour and the release of Volatile Organic Compounds (VOCs) into the surrounding

DRAFT

ambient air from removal of the contaminated soil/sludge as well as temporary emissions from diesel combustion engines during site preparation and construction and operation phases. Odour is not being separately monitored, but the parameters listed will provide indicative/comparative information. If odour does become an issue additional mitigative measures will be implemented.

Mitigation measures that will be implemented to address potential effects to air quality will include, but are not limited to, the following:

- Manage dust emissions through the use of water or dust suppressants, where applicable and based on regulatory direction and approval.
- Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion.
- Keep waste material contained through use of Geotubes®.
- Cover the dredged sediment when not contained within Geotubes® to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary.
- Implement and enforce reduced speed zones for Project vehicles traveling within the Site.
- Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance.

Once the mitigation measures are considered, the residual effect will not be significant. A significant adverse environmental effect for air quality and odour has not been predicted for the Project due to the following mitigation measures:

- Implementation of Geotube® enclosures
- Wet suppression controls on all unpaved surfaces
- Speed reduction on the Site to keep dust levels to a minimum
- Air quality monitoring including dust and ambient-air monitoring, as required

6.2 Greenhouse Gas

The potential effect resulting from the Project on Greenhouse Gas (GHG) emission levels is the long-term production of LFG from the CC.

Mitigation measures that will be implemented to address potential effects of GHG will include, but are not limited to, the following:

- Reduce organic material being deposited into the CC by diverting clean component of cattails.
- Cap the CC after remediation is complete, reducing methane migration.
- Final landfill cover contours will be designed to accommodate the anticipated range of final waste volumes and control the release of LFG.
- Control the release of LFG through passive venting.

DRAFT

6.3 Noise

The potential effect resulting from the Project on noise is temporarily elevated sound levels due to increased heavy equipment and, the operation of Site infrastructure required for remediation, dredging and demolition activities.

Mitigation measures that will be implemented to address noise include, but are not limited to, the following:

- Implement a noise management plan including BMPs for noise control during demolition activities such as equipment management, worker training, preventative maintenance plans and complaint response plan.
- Restrict road traffic generally to 16 hours per day during the construction and operation phases.
- Undertake regular checks for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely.
- Site designed to minimize the need for reversing and vehicle reversing alarms.

6.4 Light

The potential effect resulting from the Project on light is a temporary elevation in light with respect to flora, fauna, and sensitive receptors in the area.

Mitigation measures that will be implemented to address potential effects to light will include, but are not limited to, the following:

- Install downward-facing lights for on-site infrastructure and Site roads.
- Install, wherever possible, motion-sensor to ensure lights are not turned on when they are not necessary.
- Only direct and focused light will be used for worker safety.

6.5 Geology, Geochemistry and Soil

The key potential adverse effect resulting from the Project on geology, geochemistry and soil is a degradation of soil quality if there was a spill/release or if impacted sediments are mobilized to previously un-impacted areas during construction activities. The positive effect to geology, geochemistry and soil will result through the removal of impacted material, which will eliminate future impacts to geology, geochemistry, and soil from occurring.

Mitigation measures that will be implemented to address potential degradation of soil quality include, but are not limited to, the following:

- In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health.
- The Contractor(s) will develop a SSEPP for SMP and implement the plan.
- The Contractor(s) EM will monitor and manage a TLTF and effluent conveyance piping to ensure no release occurs.

DRAFT

- The Contractor(s) EM will monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats).

6.6 Groundwater

The key potential effects resulting from the Project on groundwater include the contamination of groundwater from a spill/release of leachate, and construction and dredging activities. These is also the potential for a change to groundwater flow through dredging activities.

Mitigation measures that will be implemented to address potential contamination of groundwater and change to groundwater flow downgradient include, but are not limited to, the following:

- The Contractor(s) will develop a SSEPP for SMP and implement the plan.
- Monitor perimeter groundwater wells for contaminants of concern.
- Construct a leachate holding tank with appropriate seals and construct spill containment in case of spill while pumping from the holding tank to tanker truck to haul leachate off-site.
- Monitor and maintain leachate collection system within CC.
- Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs.

6.7 Surface Water

The key potential effects resulting from the Project on surface water include the effect on water quality due to the re-suspension of sediment resulting in increased suspended solids and turbidity. In addition, a potential leachate spill or the release of petroleum products has the potential to result in surface water impacts; however, a potential spill or release is not considered likely.

Mitigation measures that will be implemented to address potential effects to surface water include, but, are not limited to, the following:

- Use silt curtains to control sedimentation.
- Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring program.
- Existing vegetation cover will be maintained whenever possible and minimize overall areas of disturbance; also, ensure Contractor(s) minimize travel across areas of exposed soil, maintaining existing vegetation cover is the best and most cost-effective erosion control practice.
- The Contractor(s) will develop a SSEPP for SMP and implement the plan.

6.8 Terrestrial Habitat and Vegetation

The key potential effects resulting from the Project on terrestrial habitat and vegetation include the temporary loss of vegetative cover, resulting in landscape disturbance and habitat fragmentation. Increased dust and heavy vehicle traffic may degrade air quality, which could reduce the amount of usable habitat for lichen species. As well, there is the potential for introduction of invasive species

DRAFT

through the transfer of seeds and roots from construction equipment, transportation vehicles, or workers into adjacent natural habitat during Project activities.

Mitigation measures that will be implemented to address potential effects to terrestrial habitat and vegetation, include, but, are not limited to, the following:

- Existing vegetation cover will be maintained whenever possible; minimize overall areas of disturbance; and, ensure Contractor(s) minimize travel across areas of exposed soils.
- Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.
- Vegetation management will be conducted by cutting (e.g., no use of herbicides).
- A riparian wetland and watercourse buffers (where practical) will be maintained to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work.
- Dust emissions will be managed through the use of water, where applicable.
- To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.

6.9 Wetlands

Wetland Management activities will result in a positive long-term effect to habitat quality through removal of contaminated sediments.

The key potential adverse effects resulting from the Project on wetlands include the temporary disturbance, alteration and loss of freshwater wetland habitat due to remediation and returned to tidal influence.

Mitigation measures that will be implemented to address potential adverse effects to wetlands, include, but are not limited to, the following:

- A wetland compensation plan will be implemented.
- A riparian wetland and watercourse buffers (where practical) will be maintained to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work.
- The Contractor(s) will complete pre-construction Site meetings with relevant construction staff to educate personnel and/or sub-contractors on the locations of wetlands and policies related to working around wetlands and watercourses.
- The Contractor(s) will identify and communicate schedule of construction activities as it relates to alteration of wetland habitat.
- To protect wetland habitat from accidental spills, the Contractor(s) will ensure that the SMP is in effect and its procedures fully communicated to staff.

6.10 Mammals and Wildlife

Remediation activities will result in a positive long-term effect to habitat quality through removal of contaminated sediments.

DRAFT

The key potential adverse effects resulting from the Project on mammals and wildlife are temporary loss of wetland habitats; temporary disturbance, alteration and loss of terrestrial habitat; and sensory disturbance as a result of increased vehicle and construction equipment use on-site.

Mitigation measures that will be implemented to address potential adverse effects to mammals and wildlife, include, but are not limited to, the following:

- Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work.
- Limit vegetation clearing to approved areas.
- Vegetation management conducted by cutting; no use of chemicals or herbicides.
- Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified.
- Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible.
- The Contractor(s) EM shall provide wildlife awareness training to all Site personnel during Site-specific orientation; wildlife awareness training will include measures to manage interactions between Site personnel and wildlife.
- The Contractor(s) shall establish a wildlife reporting protocol through a SSEPP so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings.-

6.11 Marine Environment

Remediation activities will result in a positive long-term effect to habitat quality through removal of contaminated sediments in the estuary. There will also be a positive impact to the marine environment, once the dam has been removed, as the re-introduction of tidal influence will result in the accessibility of several hundred hectares of habitat to anadromous fish species and other marine organisms.

The key potential adverse effects resulting from the Project on the marine environment are an increased disturbance to the marine environment from heavy machinery operation in and around the estuary, the release of contaminants that have been historically contained in sediments during the wetland remediation process, and removal of marine vegetation resulting in loss of aquatic habitat during dredging of the estuary and removal of the dam.

Mitigation measures that will be implemented to address potential adverse effects to the marine environment, include, but are not limited to, the following:

- The Contractor(s) will complete a pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas.
- Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat. No herbicides shall be used near possible fish habitat.

DRAFT

- The Contractor(s) will ensure proper ESC's are in place prior to the removal of the dam control structure.
- To protect the marine environment from accidental spills, the Contractor(s) will ensure that the SMP is in effect and its procedures are fully communicated to staff.

6.12 Fish and Aquatic Habitat

Remediation activities will result in a positive long-term effect to fish and aquatic habitat through removal of contaminated sediments in the Site Study Area. There will also be a positive impact once the dam has been removed, as the re-introduction of tidal influence will result in the accessibility of several hundred hectares of habitat to anadromous fish species.

The key potential adverse effects resulting from the Project on fish and aquatic habitat are the direct destruction of resident fish as required during the removal of impacted sediments, the disturbance, alteration and loss of aquatic habitat, and the suspension of impacted sediments which will increase levels of TSS, TDS and turbidity. There will also be a decrease in surface water volume when the flow control structure is removed.

Mitigation measures that will be implemented to address potential adverse effects to the fish and aquatic habitat include, but are not limited to, the following:

- The Contractor(s) will submit on behalf of NSLI surface water alteration applications (wetlands and watercourses) during Project planning and design to request an authorization to alter fish habitat. Loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish habitat.
- Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat. No herbicides shall be used near possible fish habitat.
- The Contractor(s) will prepare a SSEPP- ESC plan and implement ESC measures to ensure site run-off is not directed towards fish habitat.
- Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to DFO direction and approval.
- To protect the marine environment from accidental spills, the GC will ensure that the SMP is in effect and its procedures fully communicated to staff.

6.13 Migratory Birds

Remediation will improve water quality at the site and avian species will no longer land/swim/forage in the waters that have been impacted by effluent. This is an overall positive effect.

The key potential adverse effects resulting from the Project on migratory birds are temporary loss of wetland habitat; temporary disturbance, alteration and loss of terrestrial habitat; and sensory disturbance as a result of project lighting and increased vehicle and construction equipment use on-site.

Mitigation measures that will be implemented to address potential adverse effects to migratory birds, include, but are not limited to, the following:

DRAFT

- Avoid removal of native vegetation during the breeding season for migratory birds where practical (beginning of April to end of August for migratory birds). Where this is not practical, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment and Climate Change Canada (ECCC) and provincial regulators.
- Large piles or patches of bare soil will not be left uncovered or un-vegetated during the breeding season, to discourage ground-nesting or burrow-nesting species (such as common nighthawk and bank swallows).
- Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season.
- Noise controlled by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible.
- Only use direct and focused light when needed for worker safety.
- Reduce light pollution on-site by installing downward-facing lights on Site infrastructure and roads. Wherever possible, install motion-sensing lights to ensure lights are turned on only when necessary.
- Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that will be submitted to NSE

6.14 Species at Risk

To date six Species at Risk (SAR) were identified within the Site Study Area through dedicated bird surveys, including Common Nighthawk (*Chordeiles minor*), Eastern Wood-Pewee (*Contopus virens*), Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Evening Grosbeak (*Coccothraustes vespertinus*), and Canada Warbler (*Cardellina canadensis*).

It is anticipated that in the long-term, the impact of the Project will have a net benefit to the area as the species biodiversity will increase and habitat for SAR and Species of Conservation Concern (SOCC) species will develop.

The key potential adverse effects resulting from the Project on SAR are temporary loss of wetland habitat; temporary disturbance, alteration and loss of terrestrial habitat; and sensory disturbance as a result of project lighting and increased vehicle and construction equipment use on-site.

Mitigation measures that will be implemented to address potential adverse effects to SAR, include, but are not limited to, the following:

- Intact forest stands and wetlands will be avoided wherever possible during detailed Project planning and design in favor of previously disturbed areas (e.g., stands disturbed by timber harvesting, existing roads, or other development). Of special concern are predominantly mature softwood stands as several SOCC lichens utilize this type of habitat.
- The Contractor(s) EM will provide wildlife awareness training to all Site personnel during Site-specific orientation. Wildlife awareness training will include measures to manage interactions between Site personnel and wild species.

DRAFT

- Noise controlled by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible.
- Reduce light pollution on-site by installing downward-facing lights for on-site infrastructure and roads. Wherever possible, install motion-sensing lights to ensure lights are only turned on when necessary.

6.15 Mi'kmaq of Nova Scotia

The overall potential effect of Project activities for PLFN is positive in returning A'se'k to a tidal estuary, enabling traditional land and resource use. Project activities will also generate employment opportunities. The construction and renewed lifespan of the bridge at Highway 348 is a positive benefit, as is the increased height and thus restored access for recreational boat traffic into Boat Harbour. The complete removal of a portion of the pipeline from Indian Cross Point east to Highway 348 property line is also a positive effect for PLFN in terms of participating in decision-making on this aspect of the Project.

The key potential adverse effects resulting from the Project on the Mi'kmaq of Nova Scotia include the temporarily increased traffic volumes, temporarily increased air, noise, and light emissions, and potential effects on residents in close proximity and/or water sources in the event of an accident or spill when transporting leachate. The intended ongoing and long-term use of the existing CC is also a key potential adverse effect.

Mitigation measures that will be implemented to address potential adverse effects to Mi'kmaq of Nova Scotia, include, but, are not limited to, the following:

- Traffic, noise, light, and air mitigation measures
- Ensuring regulatory compliance in transporting Dangerous Goods
- Adequate driver training and training in accident or malfunction protocols
- All accommodations in Section 8.2.11 to restore Aboriginal and Treaty Rights

6.16 Economic and Social

The potential effects of the Project on the economic environment are anticipated to be positive with respect to job creation and economic spinoff. The construction and renewed lifespan of the bridge at Highway 348 is a positive benefit to the social environment, as is a long-term reduction in odours and air emissions through closure of the SB, aeration stabilization basin and filling of effluent ditches with clean fill.

The key potential adverse effects resulting from the Project are related to the social environment and include noise, light, and air emissions resulting from site activities such as the import and use of heavy machinery which may affect local residents.

Mitigation measures that will be implemented to address potential adverse effects to economic and social environment, include, but, are not limited to, the following:

DRAFT

- BMPs for noise, light, and air emission control during construction activities will be followed including equipment management, worker training, preventative maintenance plans and complaint response plan
- Vehicle traffic on the Site will generally be restricted to 16 hours per day
- Management of dust emissions through the use of water, where applicable

6.17 Archaeological/Cultural Heritage Resources

The potential adverse effect resulting from the Project on archaeological/cultural heritage is the disturbance, destruction and/or loss of archaeological/cultural heritage resources.

Mitigation measures that will be implemented to address potential adverse effects to archaeological/cultural heritage, include, but are not limited to, the following:

- In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance
- Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites
- Complete operator training for identification of potential archaeological/cultural heritage resources
- Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential
- As outlined in the contingency plans section, in the event that archaeological/cultural resources are encountered during waste management activities, all work will be halted and immediate contact made with the -appropriate stakeholders.

6.18 Human Health

The potential effects of the Project on human health are anticipated to be positive with respect to long-term air quality improvements and elimination of contaminated sediments from Boat Harbour.

The key potential adverse effects resulting from the Project related to human health include increased traffic volumes, noise, light, and air emissions resulting from site activities such as the import and use of heavy machinery for remediation activities which may affect local residents.

Mitigation measures that will be implemented to address potential adverse effects to human health, include, but are not limited to, the following:

- Mitigative measures for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan
- Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions
- Vehicle traffic on the haul road will generally be restricted to 16 hours per day
- Ensure proper road signage

DRAFT

7. Project Environmental Protection Plan

The PEPP has been prepared under separate cover. The PEPP was developed based on the framework initiated in the EIS. The PEPP is designed to provide overall comprehensive strategy for the protection of the natural environment throughout the course of all project remediation activities. The PEPP includes the general construction and mitigative measures found in the SSEPPs. The PEPP contain important field information for Contractor(s) and Site personnel and have been based on a review of the specific environmental conditions of the project area, identification of the potential Project-environment interactions, identification of the potential changes to the existing environment from the proposed construction activities and identification of the necessary environmental protection measures to avoid/prevent, minimize, or reduce the potential adverse environmental effects.

The PEPPs are intended to be prepared and implemented by the Contractor(s) as per their contract with the Proponent and in parallel with the Contractor(s) more SSEPPs. These plans are designed to protect the integrities of the environment and the safety of on-site works and visitors.

Sections of the PEPP include: description of the activity and associated concerns, required permits and approvals, definition of responsible authority, reporting procedures, documentation requirements and mitigation measures. It is the Contractor(s) responsibility to review and follow the SSEPPs and to develop environmental protection measures from any additional construction activities, as necessary. The Site-Specific EPPs will be submitted for review and approval by NSLI via the CMOC. Modification of the PEPP to reflect the more detailed Site-Specific EPPs will be part of the CMOC scope of work.

8. Environmental Effects Monitoring Plans

Follow-up programs will verify the accuracy of the effects assessment and determine the effectiveness of the measures implemented to mitigate the adverse effects of the Project. Follow-up programs are an integral part of the broader EMP that will be implemented post-approval for the purposes of verifying environmental effects predictions and the effectiveness of mitigation (as detailed in Section 8.3). Follow-up programs also provide NSLI with a means of ensuring compliance with applicable laws and regulations targets, and objectives for continuous improvement.

Monitoring programs for the construction phase will be established in consultation with regulatory agencies and as part of the permitting process through the Conditions of Approval. Notwithstanding this, proposed monitoring plans are discussed below that describes the objectives and substance of monitoring, as they are currently understood.

All monitoring reports will be posted on the Boat Harbour Remediation Project website and provided to PLFN in hard copy, as well as further distribution as required through the Conditions of Approval(s).

DRAFT

8.1 Environmental Effects Monitoring

The purpose of a EEM is to ensure that proper measures and controls are in place in order eliminate or lessen the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. EEM provides NSLI with the means for identifying undesirable change to the environment and a basis for adaptive management (if and as required).

Table 8.1 summarizes the preliminary monitoring programs presently proposed for the Project that were developed based on a conceptual level of design (including the management of leachate from the CC and groundwater monitoring). The preliminary monitoring programs will be finalized based on discussions with regulators, public stakeholders, and PLFN, as appropriate. The finalized monitoring programs will include specific measures to ensure that post-remediation contaminant levels meet standards so that the area can return to a naturalized state.

Table 8.1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs
Air Quality and Odour	The Independent Ambient Air Monitoring Program will continue during full scale remediation until completion. It will include the following air contaminants for long-term monitoring at the Fixed Monitoring Station and real-time monitoring within Boat Harbour. Fixed Long-term Monitoring Long-term monitoring parameters may include: • Total Suspended Particulate (TSP) • Particulate Matter with Aerodynamic Diameter less than or equal to 10 microns (PM10) • Particulate Matter with Aerodynamic Diameter less than or equal to 2.5 microns (PM2.5) • Metals and Mercury • Polycyclic Aromatic Hydrocarbons (PAHs) • Speciated Volatile Organic Compounds (VOCs) • Dioxins and Furans • Ammonia, Acetaldehyde, and Formaldehyde • Speciated Reduced Sulphur Compounds • Chlorine, Chlorine Dioxide, and Methanol Real-time Monitoring Real-time monitoring may include: • Total Suspended Particulate (TSP) • Particulate Matter with Aerodynamic Diameter less than or equal to 10 microns (PM10) • Hydrogen Sulfide (H2S) • Total Volatile Organic Compounds (TVOCs)
Groundwater	Groundwater Quality and Quantity Monitoring • The groundwater quality and quantity monitoring program will at a minimum involve the locations, frequency and parameters of the

DRAFT

Table 8.1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs
	existing program in place at the Site and will be supplemented if directed by regulatory authorities.
	Containment Cell Monitoring • As part of containment cell closure, infrastructure for long-term monitoring and care of the containment cell will be constructed, including, the required groundwater and leachate monitoring wells. • Leachate collection system cleanout riser piping will be installed to allow for long-term inspection, maintenance, and cleaning of the leachate collection piping. • The long-term groundwater monitoring program will track changes in groundwater quality and flow over time and will be used to assess the validity of the model predictions regarding the containment cell and liner systems performance.
Surface Water	Water Quality Monitoring • Samples will be collected during a wet event[2] and during a dry event[3] in spring, summer, and fall periods. • Samples from each of the main streams entering Boat Harbour, plus one from the pond outfall near the containment cell will be collected. Total Suspended Soils (TSS) Monitoring • Monitoring will include the enforcement of limits on specific contaminants of concerns (COCs) that may be associated with the suspended solids (i.e., metals, dioxins and furans). Water Quantity Monitoring • Flow measurements will be collected at the Boat Harbour outlet throughout remediation. Containment cell Monitoring • As part of containment cell closure, a surface water monitoring station will be constructed to facilitate ongoing surface water monitoring.
Wetlands	Post Remediation Monitoring • Areas within the wetlands will be re-evaluated following the decommissioning of the Site • The Wetland Compensation Plan will include monitoring of newly created or restored wetlands.
Mammals and Wildlife	Post Remediation Monitoring • Environmental monitoring will take place in areas thought to have a high potential for contamination after the Site is decommissioned, these include wetland areas found near the containment cell, and monitoring water quality at the mouth of the BHSL. • Monitoring of remedial activities to evaluate their ability for allowing natural re-establishment of habitat for native species and monitoring wetlands for condition and integrity may be necessary post decommissioning phase.

[2] A wet event is defined as a sampling event following a rainfall event in excess of 5 mm
[3] A dry event is defined as a sampling event following a minimum of 3-4 days of no rain

DRAFT

Table 8.1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs
Marine Environment	Post Remediation Monitoring • Areas within the estuary will be re-evaluated following the decommissioning of the Site to identify trends or impacts to wetlands due to project activities.
	BHSL and Basins Confirmatory Sampling • Confirmatory sampling of BHSL and Basins will be completed after remediation has been completed.
Migratory Birds	Bird Monitoring • Should Project Components/Activities occur during the breeding bird season, a nest survey will be conducted within 10 days of any activity occurring. Should a nest be identified, a buffer must be established and the nest is to be monitored. • Monitor known nests near equipment or material stockpiles and exposed areas from a distance with a spotting scope or binoculars to verify the effectiveness of the buffer until the nests are inactive.
Species at Risk	Post Remediation Monitoring • Environmental monitoring shall take place after the site is decommissioned, at wetland areas found near the containment cell, and the water quality will be monitored at the mouth of the BHSL. • Monitoring of remedial activities to evaluate their success in establishing habitat for wildlife and monitoring wetlands for condition and integrity may be necessary post decommissioning phase.
Mi'kmaq of Nova Scotia	Country Food Monitoring • Post Remediation Monitoring of country foods (such as edible fish, shellfish, birds and/or aquatic plants) will be conducted within the remediated sediment areas (aquatic areas) at the Site.
	HHERA • Confirmatory sediment sampling will be completed to confirm Site Specific Target Levels (SSTLs) are met, based on human health sediment contact.
Economic and Social	Roadway Monitoring • Monitor roads and highways for pavement conditions and liaise with Nova Scotia Transportation and Infrastructure Renewal (NSTIR) as needed to facilitate repairs.
Archaeological/Cultural Heritage Resources	• Monitoring of excavation works in areas noted to have archeological potential. • Members of PLFN community will be given the opportunity to be on-site during all ground disturbance work. • Rock trap will be monitored for any archeological artifacts. In the event that human remains or intact archaeological deposits are encountered during any work associated with Project Components/Activities, all work in the associated area(s) will be halted and immediate contact made with the Coordinator of the

DRAFT

Table 8.1 Summary of the Preliminary Monitoring Programs Proposed for the Boat Harbour Remediation Project

Valued Component	Preliminary Monitoring Programs
	Special Places Program (Sean Weseloh McKeane: 902-424-6475). • If human remains are encountered, immediate contact will also be made with the Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw-klusuaqn Negotiation Office (Heather MacLeod-Leslie: 902-843-3880). • An exclusion zone of 100 m surrounding the area will be established should any cultural resources be encountered. • If human remains or intact archaeological deposits are discovered no further ground disturbance work will be permitted at the Site until approval has been received from the appropriate regulatory agency to resume the work.
Human Health	Air Monitoring • See the proposed monitoring programs associated with the air quality and odour VC.
	Country Food Monitoring • See the proposed monitoring program for Mi'kmaq of Nova Scotia.
	HHERA • See the proposed monitoring program for Mi'kmaq of Nova Scotia.

8.2 Construction/Mitigation Monitoring

During construction, the Contractor(s) shall monitor their construction activities for environmental impacts to determine whether the impact-minimizing measures developed for the activity are effective. The main purpose of Construction/Mitigation Monitoring is to identify the source of air and/or water contaminants before any contaminants impact the receiving environment.

The PEPP and Site-Specific EPPs contain specific mitigation measures to minimize impacts by identifying potential impacts related to each activity and providing general and activity specific proactive procedures.

8.2.1 General Monitoring Duration and Frequency

Environmental monitoring at the site falls into four broad categories:

1. Daily and weekly inspections.
2. Monitoring of Site for ecological impacts.
3. Environmental monitoring of identified parameters.
4. Adaptive management to achieve environmental objectives.

All environment monitoring shall be conducted under the direction of the Contractor(s)'s Environmental Coordinator. The Contractor(s) shall utilize external qualified environmental professional resources where required to supplement resources for specialized activities (i.e., tree inventory, bird nest survey, fish rescue/salvages, installation of exclusionary bird netting, etc.),

DRAFT

environmental monitoring of high risk activities or in support of adaptive management strategies. Further details of the environmental monitoring duration and frequency are described in the PEPP prepared under separate cover.

Monitoring will be conducted from the start of remedial activities until the end of decommissioning activities. The details of the monitoring programs will be determined in consultation with regulatory agencies. The EMP will be updated to reflect detailed monitoring programs where applicable. The following areas will be included in the inspection of mitigation measures and assessment of effectiveness on a weekly basis during Construction:

- Terrestrial Habitat and Vegetation Monitoring
- Wetlands Monitoring
- Mammals and Wildlife Monitoring

8.2.2 Air Monitoring

The ambient air quality monitoring (including dust) will occur during the site preparation and construction and operation phases of the Project. The primary objectives include but not limited to:

- Concentrations of contaminants are below provincial and federal threshold and/or the conditions of the Industrial Approval (IA) issued by NSE.
- On-site dust abatement is effective.
- Project activities that required additional mitigation measures are identified.
- The monitoring conditions of the IA are met.

The frequency of the sampling periods during the Project and sampling locations will be confirmed based on the results of the finalized IAAMP, and in consultation with regulators, the parameters to be sampled and the frequency during remediation will be confirmed. The frequencies of sampling will follow NAPS and possible variations as outlined by subsequent approvals.

8.2.2.1 Anticipated Reporting During Remediation

The number, content, frequency, and format of the Independent Ambient Air Monitoring Reports during remediation will be confirmed with regulatory agencies.

Reporting requirements for the fixed long-term monitoring are anticipated to be similar to the reporting that is being completed for the ongoing long-term monitoring:

- Weekly Interim Report
- Monthly Fixed Station Report
- Monthly Non-Technical Summary

8.2.3 Real-time Monitoring

The real-time monitoring is critical to ensure the remediation work is carried out in a safe manner without the release of harmful levels of air emissions. The primary objective of real-time monitoring is to measure air quality, on a continual basis at Fixed Monitoring Stations (i.e., downwind fence line

DRAFT

perimeters). Monitoring data are compared to approved, short term actions levels developed to assist the Contractor(s) and CM in immediately modifying site activities and preventing exceedances of health-based compliance criteria.

The real-time work will focus available resources on those contaminants that pose the most significant health risks during remedial. Real-time monitoring will include sampling total volatile organic compounds (TVOCs) particulate matter (TSP, PM_{10}) and methane (H_2S) using real time equipment and collected upwind and downwind at fence line perimeters.

Table 8.2 Ambient Air Quality Standards for this Assessment

Indicator Compound	Averaging Period	Concentration	Source
		µg/m^3	
TSP	24-hour	120	NSAQS
	Annual	70	NSAQS
TVOC	24-hour	Compound specific	Compound specific
PM_{10}	24-hour	50	Ontario - Interim
$PM_{2.5}$	24-hour	28	CAAQS (2020)
	Annual	10	CAAQS (2020)

Notes:
µg/m^3 – micrograms per metre cubed
Ontario Interim guideline for PM_{10} is no longer in effect, provided for informational purposes only
$PM_{2.5}$ 24-hour CAAQS for 2020 is based on the 3-year average of the 98th percentile of the daily 24-hour concentrations
$PM_{2.5}$ Annual CAAQS for 2020 is based on the 3-year average of the annual average concentrations
VOCs will be compound specific

8.2.3.1 Anticipated Reporting During Remediation

Reporting requirements for the real-time monitoring are anticipated to be similar to the reporting that was completed for the real-time monitoring during the pilot scale activities:

- Daily reports.

8.2.4 Groundwater Monitoring

Groundwater Quality and Quantity Monitoring

The groundwater quality and quantity monitoring program will at a minimum involve the locations frequency and parameters of the existing program in place at the Site and will be supplemented if directed by regulatory authorities.

8.2.4.1 Anticipated Reporting During Remediation

Groundwater quality monitoring will be conducted every week.

DRAFT

8.2.5 Surface Water

Surface water quality monitoring programs for the construction phase will be established in consultation with regulatory agencies and as part of the permitting process through the Conditions of Approval. Notwithstanding this, a proposed water quality monitoring plan is discussed below that describes the objectives and substance of monitoring.

Water Quality Monitoring (during operations)

The Contractor(s) will be required to complete daily monitoring of dewatering effluent with collection of 24 hour, time based composite samples of dewatering effluent that will be returned to the active dredging area. Submit collected samples to a CALA accredited lab for parameters in Table 8.3. Regulate operation of dredging and slurry conditioning systems such that concentrations of all parameters listed in Table below do not exceed mass loadings listed within the Table. Adjust dredging rate and chemical conditioning program as required to meet specified discharge parameters. The Contractor(s) will provide calculated mass loading data based on sample results (per above) and dredging rate over period of sampling. The Contractor(s) shall execute analytical testing (as described above) to facilitate mass loading concentrations. The Contractor(s) shall procure expedited analytical results (maximum 48 hours turnaround time) to facilitate mass loading calculations.

Table 8.3 Dewatering Effluent Mass Loading Limits

Parameter	Unit	Daily Limit
Cyanide	g/day	14.4
pH		6-9
Metals		
Total Mercury (Hg)	g/day	0.48
Methylmercury	g/day	0
Total Aluminum (Al)	g/day	24780
Total Arsenic (As)	g/day	0
Total Barium (Ba)	g/day	1392
Total Cadmium (Cd)	g/day	2.64
Total Chromium (Cr)	g/day	30
Total Copper (Cu)	g/day	132
Total Lead (Pb)	g/day	25.8
Total Nickel (Ni)	g/day	37.2
Total Silver (Ag)	g/day	1.68
Total Thallium (Ti)	g/day	0
Total Uranium (U)	g/day	2.04
Total Vanadium (V)	g/day	52.8
Total Zinc (Zn)	g/day	342
Hexavalent Chromium (Cr VI)	g/day	0
Petroleum Hydrocarbons		
Benzene	g/day	0
Toluene	g/day	0
Ethylbenzene	g/day	0

DRAFT

Table 8.3 Dewatering Effluent Mass Loading Limits

Parameter	Unit	Daily Limit
Total Xylenes	g/day	0
C6 - C10 (less BTEX)- GAS	g/day	0
>C10-C16 Hydrocarbons- FUEL	g/day	882
>C16-C21 Hydrocarbons- FUEL	g/day	1644
>C21-<C32 Hydrocarbons- LUBE	g/day	4320
Modified TPH (Tier1) GAS/FUEL/LUBE	g/day	6846
Dioxins and Furans		
2,3,7,8-TCDD	g/day	0
Polyaromatic Hydrocarbons		
1-Methylnaphthalene	g/day	-
2-Methylnaphthalene	g/day	-
Acenaphthene	g/day	-
Acenaphthylene	g/day	-
Benzo(a)pyrene	g/day	-
Chrysene	g/day	-
Fluorene	g/day	-
Naphthalene	g/day	-
Pyrene	g/day	0.408
Quinoline	g/day	-
Rainbow Trout (Acute)	Pass/Fail	Pass

8.2.5.1 Anticipated Reporting During Remediation

Sampling and analysis for these parameters will take place on a daily basis.

Summary of results will be reported weekly, with immediate notification to CMOC of exceedance.

Total Suspended Soils (TSS) Monitoring

The TSS will be monitored over the extent of the study area before beginning remediation work. Monitoring will include the enforcement of limits on specific contaminants of concerns (COCs) that may be associated with the suspended solids (i.e., metals, dioxins and furans).

8.2.5.2 Anticipated Reporting During Remediation

Sampling and analysis for TSS will take place multiple times per day in the active work areas.

Summary of results will be reported weekly, with immediate notification to CMOC of exceedance.

Water Quantity Monitoring

Flow measurements will be collected at the Boat Harbour outlet throughout remediation.

8.2.5.3 Anticipated Reporting During Remediation

Flow measurement results will be summarized monthly.

DRAFT

8.2.6 Marine Environmental Monitoring

Monitoring will be conducted from the start of remedial activities until the end of decommissioning activities. The details of the monitoring programs will be determined in consultation with regulatory agencies. The EMP will be updated to reflect detailed monitoring program.

As ESC Plan will be developed and implemented. The ESC Plan will include a monitoring program for site runoff and will be reviewed and approved by NSEL. Mitigation plans for environmental impacts due to contaminated soils and sediments from the Project site will be implemented using risk and remediation management plans which will be approved prior to construction.

8.2.7 Fish and Fish Habitat Monitoring

Monitoring fish and fish habitat within the site will be established by NSDFA and DFO as required. Details and specific conditions for all follow-up monitoring are to be determined by NSDFA and DFO in discussions with the Contractor(s) and Proponent.

8.2.8 Migratory Birds Monitoring

A Migratory Birds Monitoring Plan will be prepared and submitted to NS DLF, and Canadian Wildlife Services (CWS) for review and approval. Bird monitoring programs will include the following, as well as additional monitoring as determined through discussions with regulatory agencies:

- A follow-up monitoring program is recommended to be conducted from the start of construction until the end of the decommissioning phase as appropriate based on monitoring results.
- Verify the effectiveness of mitigation measures related to heavy machinery usage in wetland areas, and areas (if any) where excessive light pollution may disorient or attract avian species.
- Any additional vegetation clearing will be minimized to the extent possible and if required shall be undertaken outside the nesting period for migratory birds identified by NSE tentatively as April 15th to August 31st; or alternatively, a breeding bird survey is conducted by a qualified professional to determine if probable, or confirmed breeding is taking place within 25 m of the project footprint. If the Project area is considered by a qualified professional to have no probable or confirmed breeding, the vegetation removal may proceed within the timing window.
- Should Project activities occur during the breeding bird season, a nest survey should be conducted within 10 days of any Project activity occurring. Should a nest be identified, a buffer must be established and the nest is to be monitored.
- Monitor known nests near equipment or material stockpiles and exposed areas from a distance with a spotting scope or binoculars to verify the effectiveness of the buffer until the nests are inactive.
- Conduct routine inspections as directed by regulators. Inspections are anticipated to be conducted daily by operators, and as required by qualified avian experts during the remediation phase of the project and all other phases that interact with directly or in-directly with those areas.

Annual reports will be available to CWS and NS DNLF.

DRAFT

8.2.9 Mi'kmaq of Nova Scotia Monitoring

The objectives for follow-up monitoring in relation to Mi'kmaq of Nova Scotia and specifically to PLFN are to ensure that there are no significant temporary effects to human health during remediation activities.

Routine noise, light, and air monitoring will provide indicators of changes to the environment from the Project in order to remain in regulatory compliance regarding Project-generated emissions and will ensure human health and safety as a priority.

8.2.10 Economic and Social Monitoring

With respect to potential effects related to increased stress and damage to road and highway infrastructure, the Proponent will monitor roads and highways and liaise with NSTIR as needed to facilitate repairs. There is no other determined need for compliance or effects monitoring programs related to effects on the economic and social environment.

8.2.11 Archaeological/Cultural Heritage Resources Monitoring

An archaeology and cultural heritage resources monitoring and contingency plan will be developed prior to construction in accordance with the EA approval conditions. The plan will be developed in consultation with PLKN stakeholders, and the Nova Scotia Museum.

Members of PLFN community will be given the opportunity to be on-site during ground disturbance work.

In the event that human remains or intact archaeological deposits are encountered during any work associated with Project Components/Activities, all work in the associated area(s) should be halted and immediate contact made with the Coordinator of the Special Places Program (Sean Weseloh McKeane: 902-424-6475). If human remains are encountered, immediate contact should also be made with the ANSMC via the Kwilmu'kw Maw-klusuaqn Negotiation Office (Heather MacLeod -Leslie: 902-843-3880).

An exclusion zone of 100 m surrounding the area will be established should any cultural resources be encountered. If human remains or intact archaeological deposits are discovered no further ground disturbance work will be permitted at the Site until approval has been received from the appropriate regulatory agency to resume the work.

8.3 Follow-up Programs and Long-Term Monitoring

Follow-up program is "to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the Project." Follow-up programs are an integral part of a broader environmental management plan that will be implemented post-approval for the purposes of verifying environmental effects predictions and the effectiveness of mitigation (as detailed in Section 8.3). Follow-up programs also provide NSLI with a means of ensuring compliance with applicable laws and regulations, and targets and objectives for continuous improvement.

DRAFT

Long-term monitoring outlined in this section is not part of the active remediation (construction) phase of the project but is included here to give an inclusive view of the ongoing monitoring that will carry on post-remediation.

Unless otherwise outlined, post remediation monitoring will be documented in the Annual Compliance Report.

8.3.1 Air Quality

Long-term monitoring for Air Quality is not required once the project is complete. Routine maintenance of the LFG management system at the CC will effectively manage the only ongoing emission source.

8.3.2 Groundwater

CC Monitoring

As part of CC closure, infrastructure for long-term monitoring and maintenance of the CC will be constructed. This will include groundwater monitoring wells, gas monitoring probes, surface water monitoring stations, perimeter fencing, and signage. Routine post-closure maintenance will include cleaning of the leachate collection system, repair to infrastructure including access roads, fencing, final cover, stormwater ditches and ponds, and monitoring stations.

The long-term groundwater monitoring program will track changes in groundwater quality and flow over time and will be used to assess the validity of the model predictions regarding the CC and liner systems performance.

The results of long-term monitoring will be reviewed and interpreted in detail annually as part of the annual reporting process.

8.3.3 Wetlands

Habitat compensation planning, if required, will be done with consultation with NSE and/or DFO to ensure no net loss of function/habitat. The specific parameters that will be measured during post remediation monitoring will be confirmed based on the results of the Human Health and Ecological Risk Assessment (HHERA) and through discussions conversations with regulators. The Wetland Compensation Plan will be reviewed on a regular basis as determined in collaboration with NSE

Post Construction Monitoring will be completed to ensure performance measures have been met. This may include hydrology, visual evaluation of the wetland and water quality shall be completed, along with any requirements outlined in the permits and approvals.

The findings will be documented on an annual basis and the scope of the program will be evaluated annually.

8.3.4 Mammals and Wildlife

The specific parameters that will be measured and the frequency of post remediation monitoring will be confirmed based on the results of the HHERA and through discussions with regulators and scientific advisors.

DRAFT

Environmental monitoring will take place in areas thought to have a high potential for contamination after the Site is decommissioned, these include wetland areas found near the containment cell, and monitoring water quality at the mouth of the BHSL.

Monitoring of remedial activities to evaluate their ability for allowing natural re-establishment of habitat for native species and monitoring wetlands for condition and integrity may be necessary post decommissioning phase.

Post remediation monitoring will be documented in the Annual Compliance Report.

8.3.5 Mi'kmaq of Nova Scotia Monitoring

Specific additional studies will be determined based on compliance and post-remediation activities including long-term monitoring of the CC. Long-term follow-up monitoring will be in alignment with the HHERA to verify remediation effectiveness and confirm the safety of recreational use and direct contact with sediment (incidental and dermal contact) and with plants, fish, shellfish, and game (organs) through ingestion. Specific parameters that will be measured will be confirmed based on the results of the HHERA and in consultation with regulators.

Post remediation monitoring of country foods (such as edible fish, shellfish, birds and/or aquatic plants) will be conducted within the remediated sediment areas (aquatic areas) at the Site. Country foods sampling requirements will be determined based on the results of the HHERA.

A second PLFN well-being survey will be conducted once remediation activities have been completed to assess and document any related changes in well-being.

With regard to ensuring potential positive effects related to employment and that opportunities are available, follow-up with Contractor(s), potentially in the form of an audit, will be conducted to ensure meaningful employment opportunities are offered to PLFN and local residents as a priority. Annual reporting requirements of employment statistics through federal funding mechanisms will also support this objective.

8.3.6 Economic and Social Monitoring

Follow-up monitoring of the economic environment is not contemplated by NSLI for non-PLFN aspects nor is monitoring for the non-PLFN social environment. Routine air monitoring will provide indicators of changes to the environment from the Project in order to remain in regulatory compliance regarding Project-generated emissions.

9. Contingency and Emergency Response Plans

One of the necessary elements in ensuring that the EMP delivers on its commitment to protecting the environment and public and worker health and safety, is to provide strategic response protocols in the event of unforeseen issues and emergency events. Although extensive protocols and monitoring systems have been established to limit the risk of emergency situations, in large multi-faceted remediation projects there are always unanticipated events that have to be addressed.

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9.1 Contingency Plans

To address the potential for unanticipated events, the Contractor(s) will develop a contingency plan containing protocols to be followed in emergency situations or in the event of other unforeseen occurrences. The contingency plan will be supplemented by the CMOC Project Health and Safety Plan (PHASP) and the Contractor(s)'s HASP, which contain specific requirements regarding Emergency Response Planning. The more task-oriented contingency plans will be developed and enclosed within the PEPP prepared under separate cover. All these plans have to be developed in accordance with the NSE Contingency Planning Guidelines (NSE, 1990) and/or the Canadian Standard Association's (CSA) *Emergency Preparedness and Response for Industry* (2003).

In addition to the Contingency Plan, all staff are required to understand the environmental considerations and mitigation measures employed to ensure the integrity of the natural environment is upheld throughout the duration of construction.

The On-Site Contingency and Emergency Response Plan shall include:

- Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency.
- Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.
- Name, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.
- Emergency Contacts: name and telephone number of official forms:
  - Contractor(s) and subcontractors.
  - Pertinent Federal and Provincial Departments and Authorities having jurisdiction.
  - Local emergency resource organizations.

9.1.1 Failure to Comply Contingency Plan

All on-site activities are subject to the protocol provisions found in numerous Project documents. While strong communication and reporting procedures have been put in pace to guard against the breach of these protocol documents, it is still possible could be overlooked during the course of the Project construction and monitoring activities.

In the event that the Contractor(s) or another responsible party has been found not to be in compliance with the requirements established in this EMP, the CMOC's HASP, the Contractor(s) HASP, the PEPPs, and/or Site-Specific EPP's or other documents pertaining to the environmental integrity of the Site or the protection of workers and the general public, immediate action will be required. The non-conformance will be identified by NSLI or their CMOC, the Contractor(s) will be notified immediately and be required to implement corrective actions. If these corrective actions are deemed to be not satisfactory or undertaken in a timely manner, NSLI will determine the further disciplinary actions and possible termination and engagement of alternate contractors to correct the non-conformance.

If required, the incident will also be reported to other appropriate government bodies (e.g. NSE or DFO) by the Agency for review.

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Monitoring

As stated above, many aspects of the follow-up and monitoring programs will be conducted through Contractor(s) and sub-contractors, but the ultimate responsibility to implement the follow-up and monitoring programs recommended resides with NSLI. As such, NSLI will take all reasonable steps to ensure the follow-up and monitoring programs are implemented as intended. All contracts issued by NSLI will state the legal and environmental requirements and obligations that must be implemented by Contractor(s) that have been established as part of the EIA.

Additional steps that NSLI will take during the Contractor(s) works include engaging the CMOC whose role is to monitor, audit, and report on environmental compliance alongside other construction contract requirements. This oversight role will ensure requirements, including bi-weekly conformity check-lists and monthly Project Meetings to discuss conformance with NSLI requirements by the Contractor(s).

9.1.2 Dredging TSS Contingency Plan

Dredging activities will be required for the remediation works. Accidental release of contaminated sediment during dredging activities may occur. These releases will potentially be the result of dredge line failure (e.g., punctured line, unsecured connections). The risks associated with the release of the contaminated sediment can be reduced by regular inspections of equipment and dredge line. The Site-Specific EPPs containing dredging contingency plans will be designed specifically for individual Project components/activity and shall include:

- The conditions in which dredging activities will cease and the contingency plan will be implemented.
- The procedure to rectify dredging issues and appropriate reporting protocols.

The Contractor(s) call develop an on-site emergency response team equipped with necessary equipment and trained personnel to manage spills and leaks.

General contingency measures will include but not be limited to:

- Immediate cessation of dredging operations.
- Installation of temporary barrier silt curtains.
- Utilizing the water level control structure to retain water for a settling period.

9.1.3 Erosion and Sediment Control Contingency Plan

There is a possibility that a structural or equipment malfunction, accident, environmental event or vandalism in construction areas could compromise the integrity of erosion control measures and/or slope stability leading to surface water sedimentation and increased turbidity. Response protocols will depend on the type of contaminants and the comparison of the contaminant level against the site-specific target limits for surface water. The upper level criteria defined as a reportable event for turbidity will be 110 percent of background, when background (upstream sample location) is greater than or equal to 80 Nephelometric Turbidity Units (NTUs). When background is less than 80 NTU, a reportable event will be greater than an increase of 8 NTU above background.

DRAFT

In the event that the Contractor(s) determines that erosion exceeds the provincial and federal approvals/authorizations and/or the specifications as outlined in this Erosion/Sediment Contingency Plan and the Contractor(s) are compromised, the Contractor(s) shall:

a) Temporarily halt activities potentially contributing to the exceedance until levels decrease to an acceptable level. During this time, all efforts will be made to rectify the cause of the exceedance.

b) Respond by:

- Installing silt curtains around active cells and work areas.
- Discontinuing or modifying water pumping rates and pre-treatment of discharged water.
- Creation/repairing of sediment fences, Rip rap, check dams and/or settling ponds.
- Repairing silt curtains and land based sediment and erosion control devices, as required.
- Utilizing the water level control structure to retain water for a settling period.

c) Resume monitoring at the restart of the ceased activity at an increased intensity level (every 15 minutes over a 60 minute period) to verify that conditions have been abated.

d) Explanatory details documenting the erosion and any corrective measures taken will be documented by the Contractor(s) EM and submitted to the CMOC for review.

e) Assess and record sedimentation effects on surrounding wildlife and natural habitats. If environmental impacts are evident, efforts to restore natural habitats to pre-sedimentation conditions shall be undertaken by the NSLI or its representative. The NSE and other applicable regulatory bodies shall also be contacted by the NSLI in the event that natural habitats have been impacted by sedimentation.

In addition, explanatory details documenting the exceedance and any corrective measures taken will be documented by the Contractor(s) EM.

Should the upper level criteria be exceeded post-construction, responses include the evaluation of potential contaminant sources and possible diversion or treatment. A list of contacts will be provided to assist site personnel in carrying out the stop-work process and other requirements of the Contingency Plan. The list will be available at construction sites and will provide contact information for internal personnel and external officials.

The Contractor(s) shall ensure that the following discharge limits for suspended solids are met for any water which is discharged from the Site to a watercourse or wetland at the Site:

Clear Flows (Normal Background Conditions):*

a) Maximum increase of 25 milligrams/litre (mg/L) from background levels for any short-term exposure (24 hours or less).

b) Maximum average increase of 5 mg/L from background levels for longer term exposure (inputs lasting between 24 and 30 days).

DRAFT

High Flow (Spring Freshets and Storm Events):*

a) Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 mg/L and 250 mg/L.

b) Shall not increase more than 10 percent over background levels when background is > 250 mg/L CCME Environmental Quality Guideline for Aquatic Life, 2002.

The Contractor(s) is responsible for ensuring the implementation of the ESC measures according to the ESC plan, along with daily inspections, monitoring and maintenance.

9.1.4 Fire Response Contingency Plan

There exists the potential for fires on all work sites that involve mechanical equipment and fuels; however, mitigative measures can be taken to minimize the potential for fires at the work site. All precautions necessary shall be taken to prevent fire hazards when working at the Site. These include, but are not exclusive to:

a) All flammable waste shall be removed on a regular basis and disposed of at an approved disposal site, according to the Site-Specific EPPs.

b) All fire equipment on the work site are to be checked on a routine basis, in accordance with local fire safety regulations, to ensure the equipment is in proper working order at all times.

c) All potential fire hazards are to be identified by the Contractor(s) prior to beginning work in an area. If a fire hazard exists, all on-site personnel working in the vicinity are to be property notified and trained in how to mitigate the risk.

d) A meeting location (i.e., muster point) shall be established by the Contractor(s) for each working area, such that in the event of an emergency, on-site workers will know where to gather.

e) Fire extinguishers shall be available at the work site. Such equipment shall comply with and be maintained to the manufacturers standards.

f) All workers shall be instructed in fire safety and emergency response protocols, as outlined in Site-Specific EPPs and the Contractor(s) HASP.

In the event that an incident involving fire does occur, the CMOC HASP and Contractor(s) HASP shall be consulted. In addition, the following safety protocols shall be followed:

a) In the event of any fire, large or small, on-site personnel shall immediately notify the appropriate Fire Department. The Contractor(s) shall also be notified immediately.

b) If and only if, the fire poses no immediate threat to human safety and only after help from the fire department is on the way, on-site personnel shall take immediate steps to extinguish the fire using the appropriate fire extinguishing equipment.

c) If the fire cannot be contained, all on-site personnel shall vacate the area. All warnings shall be delivered in such a way that the safety of vacating workers is not jeopardized.

DRAFT

d) On-site workers who have vacated the area of the fire shall gather at a safe location, identified by the Contractor(s), who will also ensure all workers who had been working in that area are accounted for. All missing persons shall be reported to the appropriate Fire Department personnel upon their arrival to the scene.

e) No worker is to re-enter the vacated area until a safety clearance has been issued by Fire Department personnel to the Contractor(s).

f) All incidents involving fire shall be reported by the Contractor(s) to the Environmental Manager, the CMOC, the NSLI, NSE and all appropriate emergency personnel. The NSLI shall inform the regulatory authorities of the reported incident, if warranted.

g) In the event that a fire event leads to a spill of contaminated material, the procedures and reporting protocol outlined in Section 8.1.5. shall be implemented.

h) In the event of personal injury or a near miss involving on-site workers, all incidents are to be reported to the NSLI by the CMOC. Any additional protocols outlined in the HASP(s) shall also be implemented, as required.

9.1.5 Fuel and Hazardous Material Spills Contingency Plan

This Fuel and Hazardous Material Contingency Plan presents a response system in the event of the release of petroleum, oils, or lubricants (POLs) or other hazardous liquids on-site. The objectives of the Plan are to:

- Generate awareness of potential spill situations.
- Establish protocols to protect persons from danger and adverse health effects.
- Ensure everyone is well trained and equipped in the event of a spill.
- Minimize impairment to the quality of the natural environment (air, water or land).
- Contain the extent of affected area and outline clear spill clean-up procedures.
- Control degree of disturbance during the work.
- Decrease risk of damage to property.
- Set out what notifications and reporting is required in the event of a spill.

In the event of an incident involving a spill or leak, spills or discharges of pollutants or contaminants under the control of the Contractor(s) and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are likely to cause adverse effects, shall forthwith be reported to NSLI by the CMOC. Such spills or discharges and their adverse effects shall be as defined in the Government of Nova Scotia *Emergency Spill Regulations* (GNS, 1995d).

The Contractor(s) shall immediately report any unauthorized release of a contaminants, by calling the 24 hour spill reporting number: 1-800-565-1633. Using this number will ensure that both the federal and provincial governments are made aware of the spill.

The following information should be recorded in the event of a spill and reported to the 24-hour spill reporting centre:

DRAFT

- Location of spill
- Time of observation of spill
- Reported by
- Probable (or known) sources of the spill
- Probable (or known) time of the spill
- Nature of material spill
- Probable (or known) volume of spill
- Probable (or known) duration of spill
- Area affected
- Mobility of spill
- Weather, water, or geographic conditions
- Action being taken to contain and/or control the spill
- Personnel at the scene of the spill
- Resources threatened (e.g., water supply, bird colony, fish kills, etc.)
- Other agencies contacted
- Any other pertinent information.

In the event of a spill or leak, the following procedure shall be followed:

a) The activity causing the spill will be stopped. If the spill or leak is minor and the individual who discovers the spill or leak is aware of the properties of the spilled substance, this individual shall attempt to stop and contain the leak or spill. Following containment, arrangements for cleanup shall be made by the Contractor(s).

b) If the spill or leak is significantly large that it cannot be cleaned, controlled or contained by the individual who discovers it or if this individual is unaware of the properties of the substance that has leaked or spilled, that person shall immediately vacate the area and notify the Contractor(s)'s Site Supervisor. Visible warnings, such as signs or pylons, shall be positioned surrounding the area of the spill and all workers shall evacuate the area.

c) The on-site Contractor(s) EM will have the full authority to take appropriate action without unnecessary delay.

d) In the event that the spill or leak enters a freshwater body (with or without fish habitat), the CMOC shall report the incident to the NSE, DFO and ECCC and coordinate a cleanup by the GC according to regulatory requirements, as dictated by the indicated regulatory authorities.

e) In the event that the spill or leak enters coastal waters, either directly or through freshwater discharge, CMOC shall notify the Canadian Coast Guard, NSE, DFO and ECCC. The Contractor(s) shall work with the Consultant and the Canadian Coast Guard in coordinating a clean-up.

DRAFT

f) All spills, whether major or minor shall be documented by the Contractor(s) EM and submitted to CMOC forthwith, along with a mitigative measures program. If the issue is not resolved in a reasonable period of time, as per the mitigative measures program developed by the Contractor(s) EM, CMOC shall contact the NSLI. CMOC shall contact NSE immediately in the event of a major spill as outlined in this section.

g) In the event of a spill, leak or discharge, the Contractor(s) EM shall work with the CMOC and the authorities (NSE and others, as required) in coordinating a clean-up, which will include the following actions, where appropriate:

- Deploy on-site personnel to contain the spilled material using absorbent material or booms, as appropriate.
- Assess site conditions and environmental impact of various clean-up procedures; Choose and implement an appropriate clean-up procedure.
- Deploy on-site personnel to mobilize pumps and empty drums (or other appropriate storage) to the spill site.
- Apply absorbents as necessary; Remove any contaminated sediment/soil, as required.
- Dispose of all contaminated debris, water, soil, cleaning materials and absorbents generated by the clean-up operation to approved disposal site.
- Take all necessary precautions to ensure that the incident does not recur.

h) During on-site activities, the following spill response resources shall be available close to potential sources of fuels and/or hazardous materials in readiness to respond to accidental releases:

- Absorbent materials (e.g., sorbent pads, Sorb-All, vermiculite)
- Small hand equipment (e.g., shovels, tool kit, sledgehammer, buckets, tarpaulins, one empty drum, personal protective equipment (PPE)
- A fire extinguisher

i) The Contractor(s) Environmental Manager shall follow all procedures outlined in CMOC HASP, Emergency Response and any additional protocols outlined in the Contractor(s) HASP. Work in the area shall only resume once the spill has been cleaned or contained and the leak stopped.

In the event of personal injury or a near miss involving on-site workers, incidents are to be reported to the Contractor(s) Site Supervisor, who will submit written documentation of the incident to CMOC who will pass the documentation on to NSLI and, if necessary, to NSE. Any additional protocols outlined in the HASP(s) shall also be implemented, as required.

9.1.6 Archaeology Contingency Plan

9.1.6.1 Archaeological Resources

In the event that archaeological/cultural resources are encountered during Project activities, all pertinent work will be halted and immediate contact made with the Coordinator of the Special Places Program.

DRAFT

In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw-klusuaqn Negotiation Office

In the event that archaeological resources are encountered during ground disturbing activities, the following procedures need to be followed in order to comply with the *Special Places Protection Act*:

1. Cease work in the area and notify personnel to stay clear of the findspot. Secure the area.
2. Contact a site supervisor.
3. Contact the consultant archaeologist.
4. Leave the findspot as-is. No more work is to continue in the area.
5. Do not remove any material from the findspot.

9.1.6.2 Human Remains

In the event that suspected human remains or a suspected burial is encountered during ground disturbing activities, the following procedures need to be followed in order to comply with the *Cemeteries and Monuments Protection Act*:

1. Cease work in the area and notify personnel to stay clear of the findspot. Secure the area.
2. Contact a site supervisor.
3. Contact the consultant archaeologist.
4. Contact 911 and indicate that human remains, or a suspected burial has been found.
5. If the human remains are suspected to represent Mi'kmaw ancestors, contact KMKNO's staff archaeologist in accordance with the KMKNO Ancestral Remains Protocol.
6. Leave the findspot as-is or, if threatened by disturbance from rainfall or debris from strong winds, protect by covering with a clean tarp or a plastic sheet (making sure not to place any weight on the finds). No more work is to continue in the area.
7. Do not remove any material from the findspot.

9.1.7 Contingency Planning in Site-Specific EPPs

Contingency plans shall be included in the Site-Specific EPPs to address potential risks resulting from specific element tasks. While the EMP provides an overview of contingency plan procedures, the Site-Specific EPPs shall be consulted and kept on hand during site activities in the event of an incident requiring mitigative action.

9.1.8 Implementation Responsibilities

Once the Contingency and Emergency Response Plans have been developed and approved, the responsibility for implementing them lies with the Contractor(s) and CMOC EM.

Specific responsibilities of the CMOC include:

- Reviewing the Contingency Plans and Emergency Response Plans and identifying any issues or concerns to NSLI Project Manager and providing suggested changes and updates.

DRAFT

- Providing advice to construction staff on proper emergency response procedures.
- Monitoring the Contractor(s) and subcontractors response to events resulting in the activation of it Contingency Plans and Emergency Response Plans and reporting to the NSLI Project Manager on the effectiveness of the response.
- Initiating actions to correct any response deficiencies identified through the audit process and bringing this to the attention of the NSLI Project Manager.
- Documenting the implementation of the Contingency and Emergency Response Plans in emergency response record for reviews by NSLI and the appropriate regulatory agencies.

Specific responsibilities of the Contractor(s) include:

- Ensuring that all construction personnel are trained in Contingency Plan Implementation and Emergency Response Techniques and that they have the appropriate equipment on hand.
- Implementing Contingency and Emergency Reponses Plans when environmental situations, as described in Section 8 of this EMP and in the Site-Specific EPPs, occur.
- Documenting the implantation of the Contingency and Emergency Response Plans for review by the Consultant, Agency and the appropriate regulatory agencies.

The emergency response records are to be incorporated into the monthly monitoring reports to identify the response that had to be taken so that changes can be made to the appropriate Site-Specific EPP and the lessons learned can be applied.

9.2 Marine Emergency Response Plan

The Marine Spills Contingency Plan – National Chapter, ISO 15544 provides the details regarding the Canadian Coast Guard (CCG) will operate to ensure an appropriate response to a marine pollution incident occurring in Canadian waters.

Any spill necessitates immediate onsite response. Therefore, spill response equipment will be stored onsite or at an appropriate local alternative, with personnel trained in emergency response available during every shift. The Contractor will assume the overall responsibility of coordinating a clean-up and maintaining this contingency current and up-to-date. In organizing a clean-up of a spill in the aquatic environment or other environmentally sensitive area, the Contractor EM, in consultation with the Canadian Coast Guard, will assess site conditions and the environmental effects of various containment and cleanup procedures including the following:

- Immediately mobilize containment and clean-up equipment and personnel.
- Deploy a floating boom or approved alternative as required.
- Assess potential for fuel recovery versus burning.
- Deploy on-site personnel to build containment dykes and commence dumping containment in drums or, if drainage system is involved, leakage will be isolated by digging a sump, deploying a pollution boom around area, or a combination of both.
- Apply absorbent material for final clean-up.

DRAFT

- Dispose of all contaminated soil, debris, cleaning materials, and absorbents in compliance with Provincial legislation.
  - Non-petroleum based hazardous materials need to be dealt with on a one-by-one basis for handling and disposal. The Contractor EM is to make the necessary arrangements for such materials.
  - Locate, map, and stake boundaries of contaminated beach/shoreline for future treatment and monitoring.
  - Assess and appropriately treat any areas disturbed by cleanup activities; and, - review causes of spill with personnel and take all necessary precautions to prevent reoccurrence.

For spills less than 5 litres and not in an aquatic environment, the Contractor EM shall take the appropriate actions to contain and clean up the spill, and also report the spill and cleanup to the CMOC by the next working day.

10. Environmental Awareness Training

Prior to any Site staff or Subcontractor entering the work zone, a review of this EMP, PEPP and associated Site-Specific EPP(s), shall be adhered to. Site staff are required to sign and acknowledge that they will adhere to the contents of the EMP, PEPP and Site-Specific EPP(s) prior to engaging in work activities at the site. A copy of the most recent version of the EMP, PEPP and Site-Specific EPP(s) will be made available on-Site at all times. In addition, information will be provided to ensure staff are aware of the process to report an environmental incident or a new identified risk.

The CMOC EM is responsible for developing and implementing the initial environmental awareness training to ensure that all on-site personnel are aware of the environmental sensitivities associated with their actions; their roles and responsibilities in protecting the environment; and, mechanisms available to them carry out their environmental protection responsibilities.

The CMOC's Environmental Awareness Training Program must satisfy the following three main objectives:

1. Educate workers and visitors about the importance of environmental protection.
2. Inform staff and visitors of their responsibilities regarding the environment and provides them with the necessary educational tools to fulfil these responsibilities.
3. Provide workers with a firm understanding of the environmental sensitivities associated with the Project and the role they play in protecting the environment, as outlined in this EMP, PEPP (through implementation tools such as the Site-Specific EPPs and Contingency and Emergency Response Plans).

The CMOC, must approve the training program before construction starts. Once approved, the CMOC shall be provided with all training records and shall keep track of all training completed.

The CMOC EM is responsible for ensuring that all on-site personnel have undergone the initial environmental awareness training before working on the Site. Proof of completion of the training programs must be kept on file on site and digitally by CMOC.

DRAFT

The awareness training must include, as a minimum, the following key factors:

- The Project overview and timetable.
- Overview of the environmental regulatory requirements: Overview of the existing environmental conditions and sensitivities.
- Identification of the construction activities that could negatively affect the environment; the resultant environmental effects; and the required mitigation measures that must be implemented and maintained to avoid or minimize these effects (e.g., proper installation and maintenance of erosion and sediment control procedures).
- All aspects of the EMP, PEPP and Site-Specific EPPs (including the roles and responsibilities of staff).
- Environmental inspection and QA/QC procedures, roles and responsibilities.
- Contingency and Emergency Response Plans.
- Documentation and Reporting Procedures.

Refresher seminars are to be held annually at minimum and as required to address any shortfalls identified during the QA/QC program. Construction personnel are to be trained in all Contingency and Emergency Response Plans and reporting procedures; Site visitors are to be made aware that Contingency and Emergency Response Plans have been developed for specific potential events.

10.1 Specific Environmental Awareness Programs

All personnel who are scheduled to perform work on the site must be aware of the timing restrictions to work activities including environmental (i.e., wildlife and fish timing windows) and hazard activities (i.e., employee may be potentially exposed). The Contractor(s) EM is responsible for including specific environmental awareness programs for the various Contingency and Emergency Response Plans in the Environmental Awareness Training of all on-site personnel including but not limited to:

- Decontamination
- Spill Response
- Emergency/Fire Response
- Cultural/Archaeological Awareness and Response Plans

The Contractor(s) will be responsible to develop and implement Activity-Specific Environmental Training that is customized to their activity-specific work. The Contractor(s)'s Activity-Specific Environmental Training Program must address the following training elements:

- Permit conditions, performance standards, environmental commitments, and environmental regulations related to the specific project work.
- Overall importance of environmental issues.
- Identifying work activities that present the greatest risk of compliance.
- Required environmental qualifications and certifications.
- Environmental records management.

DRAFT

- Environmental compliance monitoring and reporting procedures.
- Environmental notification triggers and emergency response procedures.

The Contractor(s) shall deliver activity-specific toolbox or tailgate talk topics onsite, targeting the pertinent construction personnel prior to each new activity. Highlight pre-construction and awareness of compliance needs and how to support the zero violation goal. Provide pre-activity environmental compliance pocket checklists for improved environmental performance.

11. General Communication & Record Keeping

The Contractor(s) shall maintain all communications and records associated with activities related to the EMP PEPP and Site-Specific EPPs. Communication protocols and procedures are currently being developed at various levels of government and other various stakeholder groups, as such this communication reporting section is subject to revisions to reflect updated information as it becomes available.

11.1 Communication

The Proponent staff will communicate directly with the other team members on a regular basis through attendance at project meetings, through telecoms and correspondence and involvement in key decisions.

The primary contact for this assignment will be between the Contractor(s) Project Manager and the CMOC Project Manager. During the start-up phase of the Project, clear communication protocol between both parties will be established by the CMOC. It is imperative that all communications follow the protocol established.

11.2 Complaint Response Protocol

The CMOC will finalize Compliant Response Protocol (CRP) for this Project in which it is the responsibility of the CMOC to implement for the entire duration of site preparation, construction, and operation. The intention of the CRP is to ensure a swift and sure response to any and all complaints from area residents and business owners. The CRP will include the following requirements:

1. Notifying residents and business owners within 500 m of construction areas of the anticipated construction schedules for each site, at least one month prior to the start date.
2. Publicize details of the complaint protocol, including contact details, service performance standards, etc.
3. Provides a 24-hour telephone service with a performance standard of fielding/responding to complaints.
4. The CMOC will be responsible to establish and maintain a complaint register to record the following key information, at a minimum, for each formal complaint:
    - Time complaint was made
    - Complainant name, address and contact information

DRAFT

- Type of issue (noise, vibration, odour)
- Date and time of issue
- Brief explanation of issue
- Effects of issue (furniture/windows rattling, cannot hold conversation outdoors, smell requires us to shut our windows, etc.)
- Name of personnel recording complaint

5. The CMOC will be responsible for the following activities at a minimum, for each formal complaint:
   - Being reactive to complaints and taking field measurements (i.e., noise, odour) of compliant activity if required
   - Reviewing any altered construction work programs for noise, vibration and odour impacts
   - Help site staff to identify any high risk activities not already considered
   - Explaining and reviewing general best practices to minimize noise, vibration and odour impacts
   - Supervision of any long-term monitoring programs if required

11.2.1 Contingency Response and Corrective Measures

Upon receipt of the complaint within the area from any resident or facility the CMOC or operations manager will begin discussions with the property owner on a remedy.

The Complainant will be advised in writing by the NSLI via CMOC of any corrective measures taken.

With respect to noise, if the source of the noise is found to be a result of an activity occurring on-site, the construction contractor/operations manager will:

- Determine the problem and take appropriate measures to mitigate the problem.
- Inform the resident of the measures taken to mitigate the problem

Should a complaint be received for a residence outside of the 1000 m radius from the Site, the CMOC will examine the situation on a case by case basis.

If construction equipment exceeds Project noise requirements and/or if corrective action is determined to be warranted through follow-up investigations, the following corrective measures will be considered:

- Replacement of construction equipment.
- Construction stoppage and/or revisions to construction schedules.
- Administrative controls such as staged construction to limit simultaneous operation of bad actors.
- Implementation of controls, including exhaust mufflers, temporary noise barriers, enclosures on generators or compressors, etc.
- Re-routing of equipment and/or travel routes.

DRAFT

- 24/7 noise monitoring if required at each complaint location.

Noise monitoring will be completed on an as needed basis in response to complaints received from the public.

Light monitoring may be completed if there are complaints to assist in identifying the significant sources of light. The light monitoring will be completed using a light meter to measure the light levels of the various operations. These results will be used to assist in identifying the sources of light that are potentially causing the complaints and help mitigate the sources of light.

11.3 Public Reporting Protocol

All interaction with the public will be through NSLI. Neither the CMOC nor the Contractor(s) will provide information or interviews direct to public or publications. All communications will be managed through the established NSLI communications plan.

11.4 Reporting

Environmental reports will be generated monthly for the duration of the Project. Results of environmental reports will be reviewed with the Project and Environmental Managers from both the CMOC and the Contractor(s) to determine what has worked and what actions need to be taken to remedy any identified environmental problems. This may involve revisions to the existing PEPP, or development of new Site-Specific EPPs as required. The Managers will then ensure that the appropriate new policies/procedures of Site-Specific EPPs are developed and provided to the Environmental Consultant or for implementation.

Maintenance of this EMP will be the responsibility of the Environmental Manager or designate to ensure that the most current and comprehensive version of this EMP as well as PEPP and Site-Specific EPPs are available to Project staff, regulating agency representatives, stakeholders, interested parties and others.

11.4.1 Annual Compliance Reporting

The Annual Compliance Report will include but not be limited to the following components:

- Wetland Monitoring
- Surface Water Monitoring
- Mammals and Wildlife
- Fish and Aquatic Habitat
- BHSL and Basin Confirmatory Sampling
- Migratory Birds
- Species at Risk
- Mi'kmaq of Nova Scotia:
  - Country Food Monitoring
  - HHERA Post-Remediation Monitoring

DRAFT

  - Additional Well-being Follow-up Survey
- Economic and Social
- Archaeological and Cultural Heritage Resources Ongoing Monitoring

Where additional reporting frequencies or content requirements are outlined through regulatory agencies, this EMP will be updated to reflect those specific requirements.

11.4.2 Air Quality

The number, content, frequency and format of the Independent Ambient Air Monitoring Reports during remediation will be confirmed with regulatory agencies. Reporting requirements for the fixed long-term monitoring are anticipated to be similar to the reporting that is being completed for the ongoing long-term monitoring:

- Weekly Interim Report
- Monthly Fixed Station Report
- Monthly Non-Technical Summary

The reporting outline shall include, but not be limited to:

- Total of emissions of (TSP, PM_{10}, H_2S and TVOCs) from the study area
- Methodologies used to measure or estimate emissions

Reporting requirements for the real-time monitoring are anticipated to be similar to the reporting that was completed for the real-time monitoring during the pilot scale activities which includes daily reports. The reports include:

- General construction information: date, time, weather, wind direction, wind speed.
- Specific information regarding the construction activity.
- Equipment calibration records.
- Sample location, time, unique identification number, sampler name.
- Signature of sampler.

All reports will continue to be posted on the Boat Harbour Remediation Project Website.

11.4.3 Groundwater

At a minimum, groundwater monitoring will be reported on an annual basis as part of the Annual Compliance Report, associated with approval of the Federal EIA. The annual report shall include, but not limited to:

- A review of field methodologies, including sampling techniques; a description of the groundwater monitoring network.
- A review of the current groundwater monitoring program and recommendations for modifications, as applicable.

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- Current and historical status water level data in tabular format; current and historical groundwater quality data in tabular format.
- A review of the current surface water monitoring program and recommendations for modifications as applicable.
- Current and historical surface water and leachate quality data in tabular format.
- Laboratory certificated of analysis.
- A detailed interpretation of the groundwater, surface water and leachate quality data including an analysis of spatial and temporal trends.
- The identification of any adverse impacts to groundwater and/or surface water as a result of remediation activities and associated recommendations, as applicable.

11.4.3.1 CC Monitoring

The results of CC monitoring will be reviewed and interpreted in detail annually as part of the annual reporting process. Annual reporting will continue through closure and post-closure. Annual data interpretation and reporting is used to ensure any deteriorations in environmental performance are identified and addressed through changes in operational practices or implementation of augmented remedial responses.

11.5 Document Control

A Quality Management Plan (QMP) will be required to be developed and implemented by the CMOC.

12. Closing

This EMP has been prepared to provide a framework for avoidance and mitigation of environmental impacts associated with the remediation of Boat Harbour. The commitments outlined herein are based on the project information available at the time of production and will require adaptation to changes in design, approach, and/or schedule and once the Project has received formal approval.

This report should be read in conjunction with the PEPP and Site-Specific EPPs, construction drawings and project specifications. In the case of discrepancy between these documents, the more stringent approach/threshold will be implemented to mitigate impacts to the natural environment.

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Appendices

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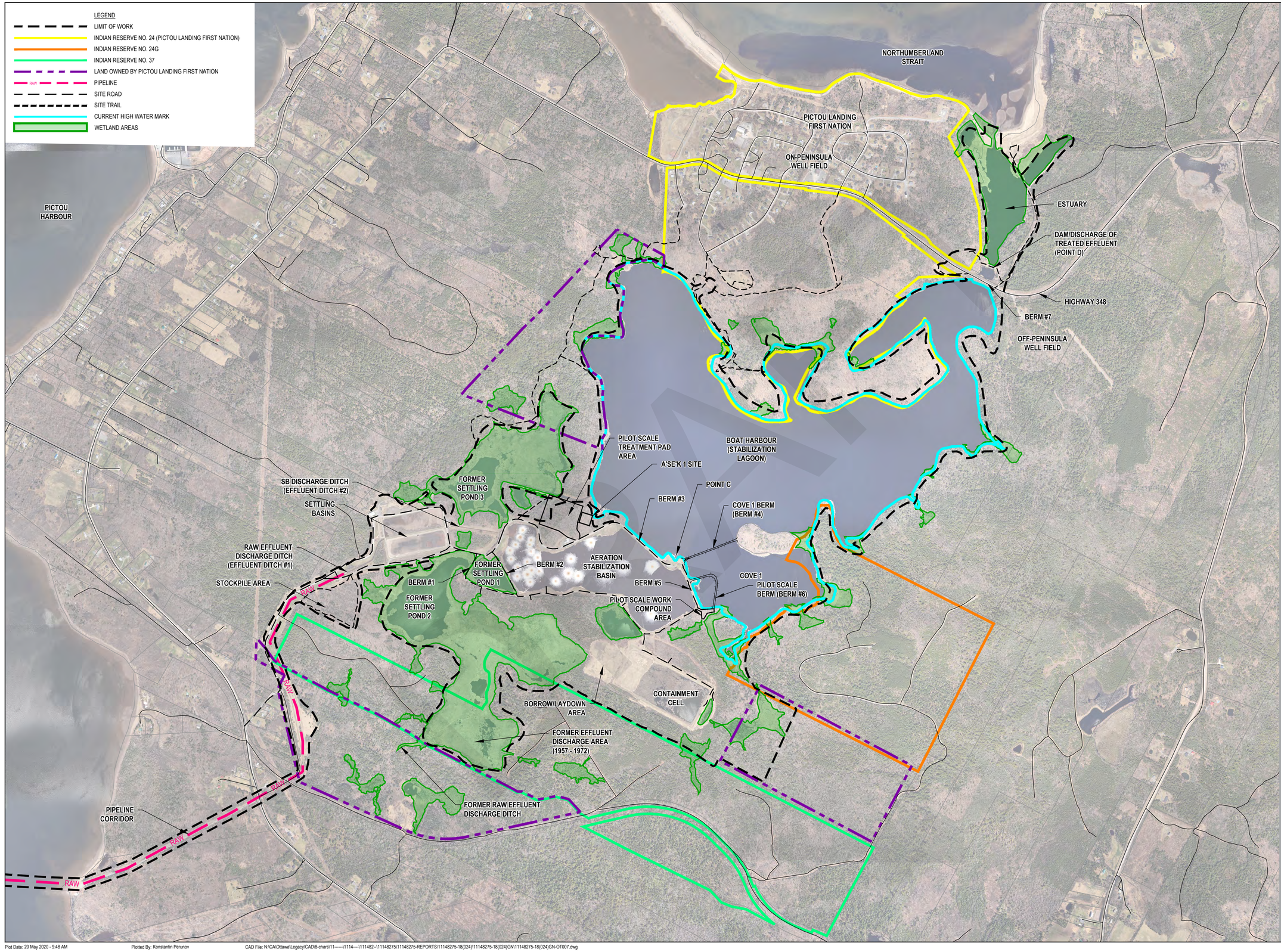
Appendix A
Supporting Drawings



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Project
BOAT HARBOUR REMEDIATION

No.	Issue	Drawn	Approved	Date
4	PRE-TENDER DELIVERABLE	DC	BS	05-21-2020
3	95% DESIGN REVIEW	DC	BS	03-12-2020
2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

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Title
OVERALL EXISTING CONDITIONS

Sheet No.
GG-G-03

Sheet of

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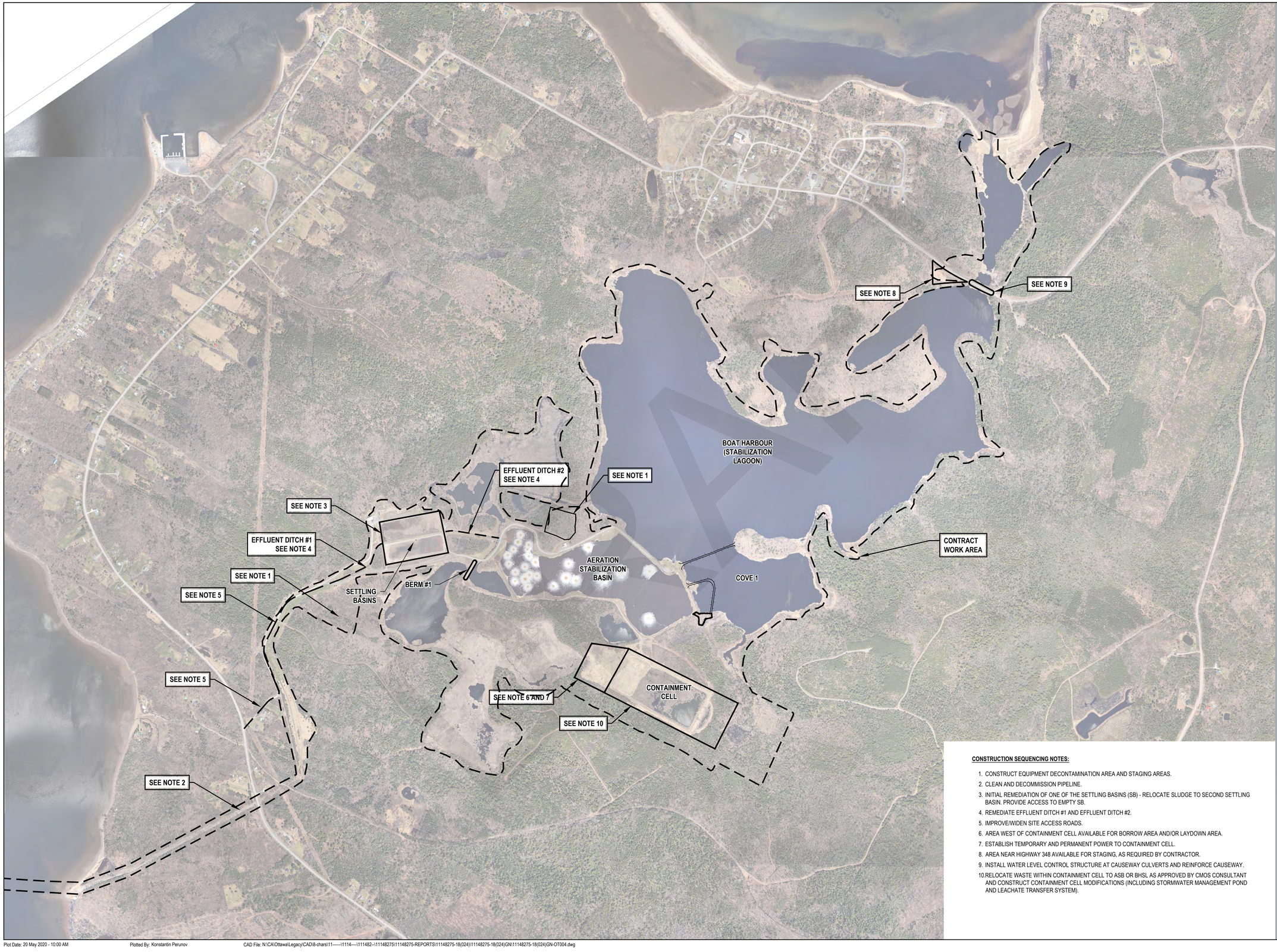

CONSTRUCTION SEQUENCING NOTES:

1. CONSTRUCT EQUIPMENT DECONTAMINATION AREA AND STAGING AREAS.
2. CLEAN AND DECOMMISSION PIPELINE.
3. INITIAL REMEDIATION OF ONE OF THE SETTLING BASINS (SB) - RELOCATE SLUDGE TO SECOND SETTLING BASIN. PROVIDE ACCESS TO EMPTY SB.
4. REMEDIATE EFFLUENT DITCH #1 AND EFFLUENT DITCH #2.
5. IMPROVE/WIDEN SITE ACCESS ROADS.
6. AREA WEST OF CONTAINMENT CELL AVAILABLE FOR BORROW AREA AND/OR LAYDOWN AREA.
7. ESTABLISH TEMPORARY AND PERMANENT POWER TO CONTAINMENT CELL.
8. AREA NEAR HIGHWAY 348 AVAILABLE FOR STAGING, AS REQUIRED BY CONTRACTOR.
9. INSTALL WATER LEVEL CONTROL STRUCTURE AT CAUSEWAY CULVERTS AND REINFORCE CAUSEWAY.
10. RELOCATE WASTE WITHIN CONTAINMENT CELL TO ASB OR BHSL AS APPROVED BY CMOS CONSULTANT AND CONSTRUCT CONTAINMENT CELL MODIFICATIONS (INCLUDING STORMWATER MANAGEMENT POND AND LEACHATE TRANSFER SYSTEM).

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Project
BOAT HARBOUR REMEDIATION

No.	Issue	Drawn	Approved	Date
4	PRE-TENDER DELIVERABLE	DC	BS	05-21-2020
3	95% DESIGN REVIEW	DC	BS	03-12-2020
2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

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Title
GENERAL STAGING 1 OF 4

Sheet No.
GG-G-04

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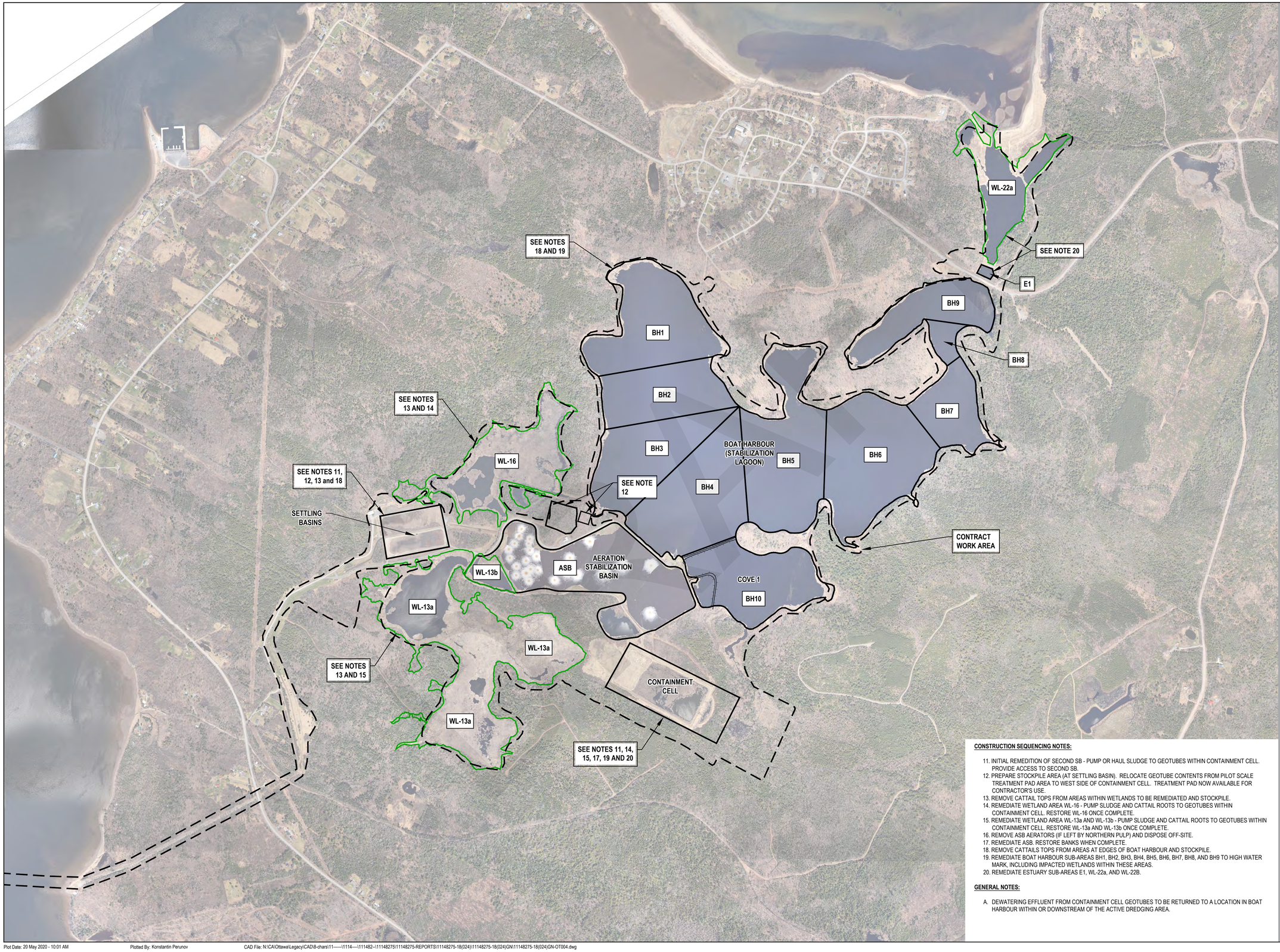

CONSTRUCTION SEQUENCING NOTES:

11. INITIAL REMEDITION OF SECOND SB - PUMP OR HAUL SLUDGE TO GEOTUBES WITHIN CONTAINMENT CELL. PROVIDE ACCESS TO SECOND SB.
12. PREPARE STOCKPILE AREA (AT SETTLING BASIN). RELOCATE GEOTUBE CONTENTS FROM PILOT SCALE TREATMENT PAD AREA TO WEST SIDE OF CONTAINMENT CELL. TREATMENT PAD NOW AVAILABLE FOR CONTRACTOR'S USE.
13. REMOVE CATTAIL TOPS FROM AREAS WITHIN WETLANDS TO BE REMEDIATED AND STOCKPILE.
14. REMEDIATE WETLAND AREA WL-16 - PUMP SLUDGE AND CATTAIL ROOTS TO GEOTUBES WITHIN CONTAINMENT CELL. RESTORE WL-16 ONCE COMPLETE.
15. REMEDIATE WETLAND AREA WL-13a AND WL-13b - PUMP SLUDGE AND CATTAIL ROOTS TO GEOTUBES WITHIN CONTAINMENT CELL. RESTORE WL-13a AND WL-13b ONCE COMPLETE.
16. REMOVE ASB AERATORS (IF LEFT BY NORTHERN PULP) AND DISPOSE OFF-SITE.
17. REMEDIATE ASB. RESTORE BANKS WHEN COMPLETE.
18. REMOVE CATTAILS TOPS FROM AREAS AT EDGES OF BOAT HARBOUR AND STOCKPILE.
19. REMEDIATE BOAT HARBOUR SUB-AREAS BH1, BH2, BH3, BH4, BH5, BH6, BH7, BH8, AND BH9 TO HIGH WATER MARK, INCLUDING IMPACTED WETLANDS WITHIN THESE AREAS.
20. REMEDIATE ESTUARY SUB-AREAS E1, WL-22a, AND WL-22B.

GENERAL NOTES:

A. DEWATERING EFFLUENT FROM CONTAINMENT CELL GEOTUBES TO BE RETURNED TO A LOCATION IN BOAT HARBOUR WITHIN OR DOWNSTREAM OF THE ACTIVE DREDGING AREA.

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Project
BOAT HARBOUR REMEDIATION

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2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

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Title
GENERAL STAGING 2 OF 4

Sheet No.
GG-G-05

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CONSTRUCTION SEQUENCING NOTES:

21. REMOVE BERM #6.
22. REMEDIATE BOAT HARBOUR SUB-AREA BH10 TO HIGH WATER MARK, INCLUDING IMPACTED WETLANDS WITHIN THIS AREA.
23. CONSTRUCT TEMPORARY BYPASS CAUSEWAY, REMOVE WATER LEVEL CONTROL STRUCTURE, REMOVE BERM #7, AND CONSTRUCT BRIDGE.
24. RESTORE WORK COMPOUND AREA. AGGREGATE TO BE HAULED OFF SITE FOR REUSE BY CONTRACTOR.
25. REMOVE BERM #5.
26. REMOVE BERM #4.
27. DECOMMISSION BOAT HARBOUR EFFLUENT TREATMENT FACILITY INFRASTRUCTURE AT POINT C. DISPOSE OF C&D WASTE OFF SITE.
28. REMOVE BERM #3.
29. REMOVE BERM #2.
30. DECOMMISSION BOAT HARBOUR EFFLUENT TREATMENT FACILITY INFRASTRUCTURE EAST OF SB. DISPOSE OF C&D WASTE OFF SITE.
31. FINAL REMEDIATION OF SB INCLUDING FILLING/GRADING WITH CLEAN FILL. RESTORE AREA.
32. CONSTRUCT TEMPORARY LEACHATE TREATMENT SYSTEM AND OPERATE.
33. DEMOBILIZE EQUIPMENT AND RESTORE AREA. AGGREGATE TO BE HAULED OFF SITE FOR REUSE BY CONTRACTOR.

GENERAL NOTES:

A. CONTAMINATED SOIL FROM BERMS #1-7 TO BE PLACED WITHIN CONTAINMENT CELL.
B. CLEAN FILL FROM BERMS #1-7 FOR USE ON SITE, INCLUDING FILLING THE SETTLING BASINS.

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Project
BOAT HARBOUR
REMEDIATION

No.	Issue	Drawn	Approved	Date
4	**PRE-TENDER DELIVERABLE**	DC	BS	05-21-2020
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2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

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Title
GENERAL STAGING
3 OF 4

Sheet No.
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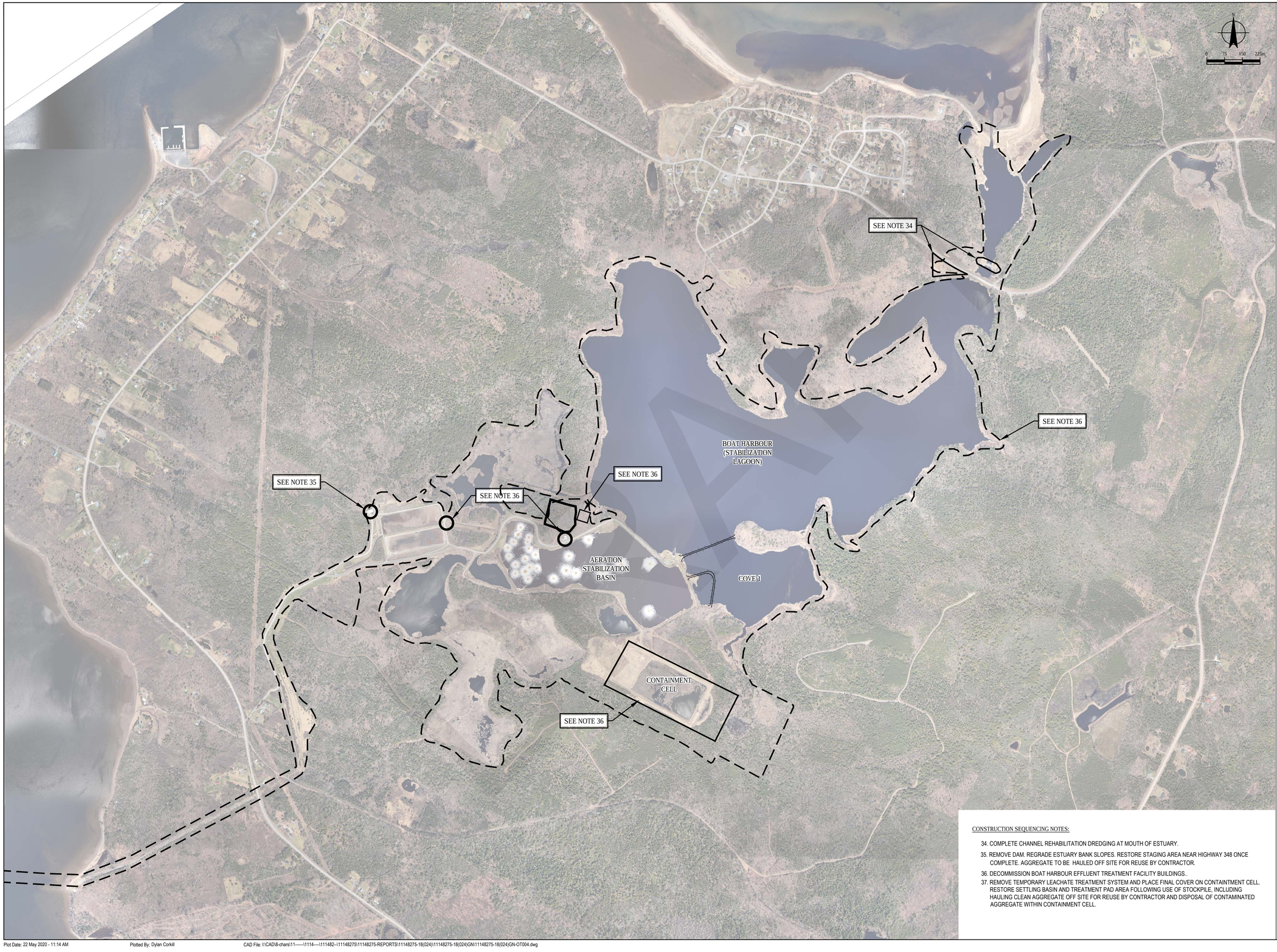

CONSTRUCTION SEQUENCING NOTES:

34. COMPLETE CHANNEL REHABILITATION DREDGING AT MOUTH OF ESTUARY.
35. REMOVE DAM. REGRADE ESTUARY BANK SLOPES. RESTORE STAGING AREA NEAR HIGHWAY 348 ONCE COMPLETE. AGGREGATE TO BE HAULED OFF SITE FOR REUSE BY CONTRACTOR.
36. DECOMMISSION BOAT HARBOUR EFFLUENT TREATMENT FACILITY BUILDINGS..
37. REMOVE TEMPORARY LEACHATE TREATMENT SYSTEM AND PLACE FINAL COVER ON CONTAINTMENT CELL. RESTORE SETTLING BASIN AND TREATMENT PAD AREA FOLLOWING USE OF STOCKPILE, INCLUDING HAULING CLEAN AGGREGATE OFF SITE FOR REUSE BY CONTRACTOR AND DISPOSAL OF CONTAMINATED AGGREGATE WITHIN CONTAINMENT CELL.

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Project
BOAT HARBOUR
REMEDIATION

No.	Issue	Drawn	Approved	Date
4	**PRE-TENDER DELIVERABLE**	DC	BS	05-21-2020
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2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

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Title
GENERAL STAGING
4 OF 4

Sheet No.
GG-G-07

Sheet of

LEGEND

PROPERTY BOUNDARY

FENCELINE

TREELINE

SHORELINE

WETLAND AREAS

BOAT HARBOUR
LAGOON

PREFABRICATED
TRUSS BRIDGE

SITE ACCESS
ROAD

SITE ACCESS
ROAD

CONTAINMENT CELL
AND LEACHATE FILL
STATION

CHAINLINK
PERIMETER FENCE

WIRE
DEMARCATION
FENCING

SURFACE
WATER POND

N

0 30 60 90m

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Project
BOAT HARBOUR
REMEDIATION

No.	Issue	Drawn	Approved	Date
2	PRE-TENDER DELIVERABLE	DC	BS	05-21-2020
1	95% DESIGN REVIEW	DC	BS	03-12-2020

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Project No. 11148275

Title
FINAL
CONDITIONS

Sheet No.
GG-G-08

Sheet of

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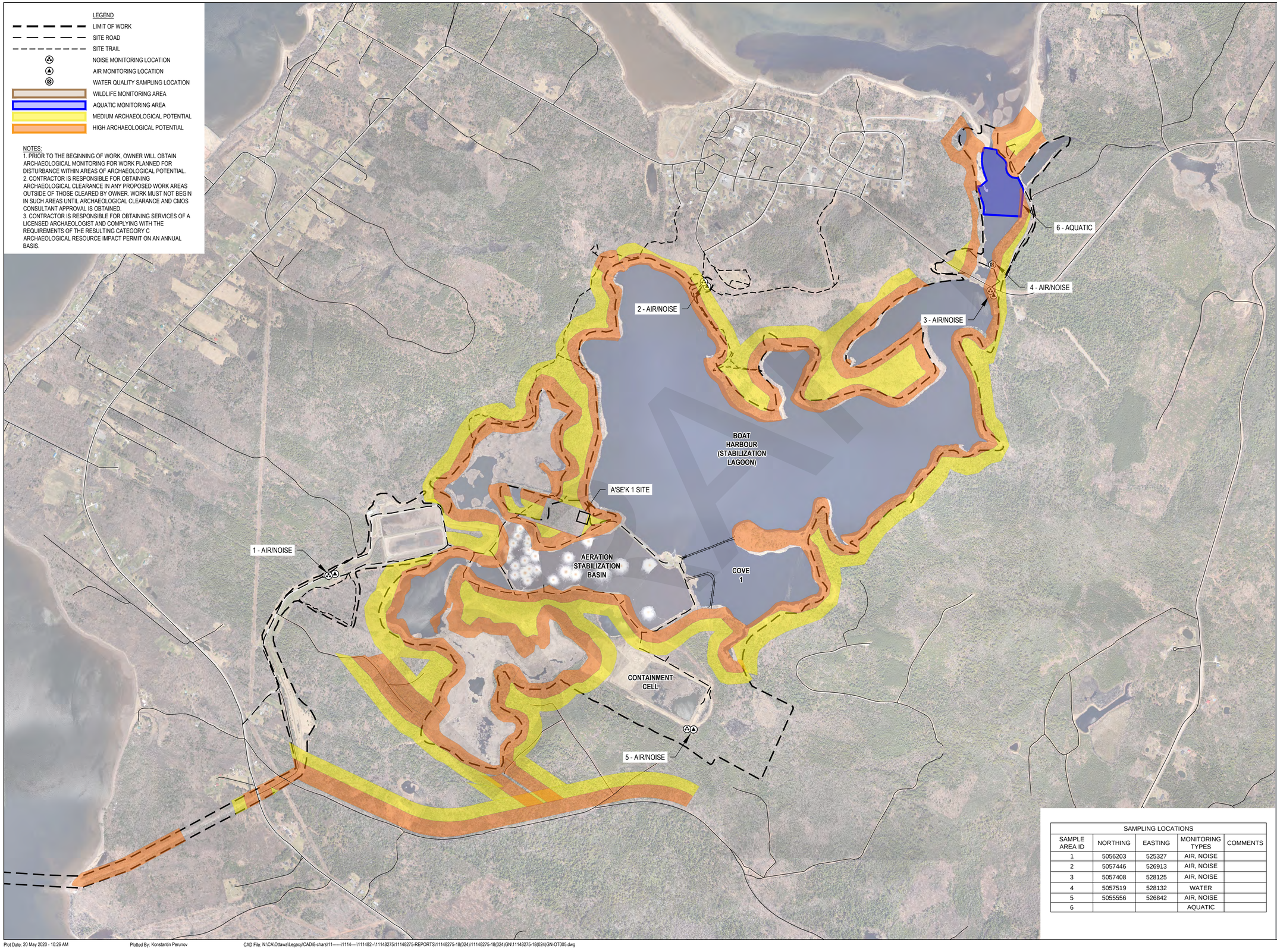

SAMPLING LOCATIONS				
SAMPLE AREA ID	NORTHING	EASTING	MONITORING TYPES	COMMENTS
1	5056203	525327	AIR, NOISE	
2	5057446	526913	AIR, NOISE	
3	5057408	528125	AIR, NOISE	
4	5057519	528132	WATER	
5	5055556	526842	AIR, NOISE	
6			AQUATIC	

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BOAT HARBOUR REMEDIATION

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Title
ENVIRONMENTAL MONITORING KEY PLAN

Sheet No.
GG-X-01

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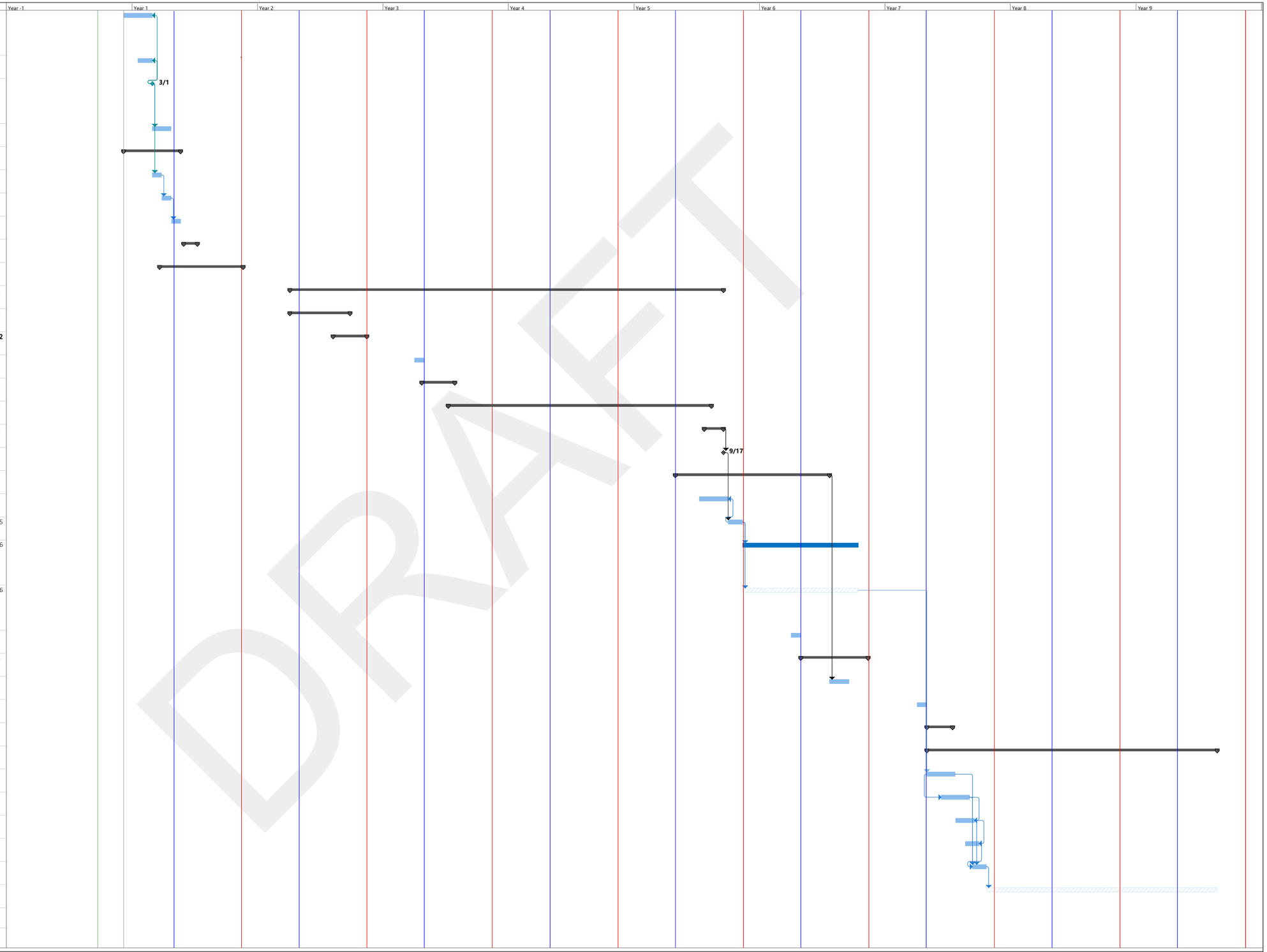
Appendix B
Summary Base Project Schedule

ID	Task Name	Duration	Start	Finish
1	Shop drawing Review, Preparation, Construction Kick-Off, Condition Surveys	3 mons	Mon 12/7/20	Mon 3/1/21
2	Contractor Mobilization	1.5 mons	Mon 1/18/21	Mon 3/1/21
3	Commencement of On-Site Construction Works	0 days	Mon 3/1/21	Mon 3/1/21
4	Access Road Improvements	2 mons	Mon 3/1/21	Fri 4/23/21
5	**Access Road Bridge**	**120 days**	**Mon 12/7/20**	**Fri 5/21/21**
8	Clean and Decommission Pipeline	1 mon	Mon 3/1/21	Fri 3/26/21
9	Initial Cleanout of Settling Basins	1 mon	Mon 3/29/21	Fri 4/23/21
10	Remediate Effluent Ditch #1 & 2	1 mon	Mon 4/26/21	Fri 5/21/21
11	**Water Level Controls Installation**	**30 days**	**Mon 5/31/21**	**Fri 7/9/21**
14	**Containment Cell Construction**	**175 days**	**Mon 3/22/21**	**Fri 11/19/21**
24	**Dredging**	**902 days**	**Tue 4/5/22**	**Wed 9/17/25**
25	**Former Settling Pond 2 (South)**	**125 days**	**Tue 4/5/22**	**Mon 9/26/22**
33	**Former Settling Pond 3 (North)**	**70 days**	**Tue 8/9/22**	**Mon 11/14/22**
41	**ANNUAL MOBILIZATION**	**1 mon**	**Mon 4/3/23**	**Mon 5/1/23**
42	**ASB (130,000m3)**	**70 days**	**Mon 4/24/23**	**Fri 7/28/23**
48	**Boat Harbour (634,000m3)**	**548 days**	**Mon 7/10/23**	**Wed 8/13/25**
104	**Estuary (33,000m3)**	**40 days**	**Wed 7/23/25**	**Wed 9/17/25**
111	Dredging Operations Secured	0 days	Wed 9/17/25	Wed 9/17/25
112	Site Demolitions	321 days	Thu 5/1/25	Thu 7/23/26
129	**Concurrent Cap Construction**	**3 mons**	**Thu 7/10/25**	**Thu 10/2/25**
130	Finalize interim containment cell cappin	1.5 mons	Thu 10/2/25	Wed 11/12/25
131	Maintenance Period (Interim Leachate Treatment)	12 mons	Thu 11/13/25	Wed 10/14/26
132	Containment Cell Consolidation Period (Estimated)	12 mons	Thu 11/13/25	Wed 10/14/26
133	**ANNUAL MOBILIZATION**	**1 mon**	**Fri 4/3/26**	**Fri 5/1/26**
134	Hwy 348 Bridge	140 days	Fri 5/1/26	Thu 11/12/26
146	Final Site Restoration Planting	2 mons	Fri 7/24/26	Thu 9/17/26
147	**ANNUAL MOBILIZATION**	**1 mon**	**Mon 4/5/27**	**Sat 5/1/27**
148	Dam Removal	55 days	Mon 5/3/27	Fri 7/16/27
157	**Containment Cell Capping**	**605 days**	**Mon 5/3/27**	**Fri 8/24/29**
158	Sand Grading Layer	3 mons	Mon 5/3/27	Fri 7/23/27
159	HDPE Cover	12 wks	Mon 6/14/27	Fri 9/3/27
160	Sand Protective Cover	2 mons	Mon 7/26/27	Fri 9/17/27
161	Drainage Composite	1.5 mons	Mon 8/23/27	Fri 10/1/27
162	Topsoil and Seed	1.5 mons	Mon 9/13/27	Fri 10/22/27
163	Cap Warranty Period	24 mons	Mon 10/25/2	Fri 8/24/29
164				
165				



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Appendix C
Example Environmental Inspection Log

Appendix C Erosion and Sediment Control Inspection Report

Project Name: **Location:**

Project No.: **Date:**

Stage of Construction		Prime Contractor	
Construction Activities		Site Supervisor	
Annotated ESC Plan/Map Attached		Site Photos	

Date	Time	Reason for Inspection	Weather During Inspection		Weather Previous Hours	
			Conditions	Temp (°C)	Conditions	Rain/Snow (mm)

Sediment Control

- ☐ Silt Fence
- ☐ Cofferdam
- ☐ Straw Bale
- ☐ Filter Bag
- ☐ Mud Mat
- ☐ Sediment Basin
- ☐ SWM Pond
- ☐ Straw/Coir Log
- ☐ Vegetative Strip
- ☐ Berm
- ☐ Catch Basin/Curb Inlet Control
- ☐ Storm Outfall Control
- ☐ Turbidity Curtain
- ☐

	Y/N	Comments
Are sediment controls installed per approved ESC plan?		
Have all repairs and maintenance tasks identified in the previous report completed by the end of the week?		
Was runoff within the construction area fully contained?		
Were soil stockpiles properly isolated?		
Was the water quality in leaving the site affected by current site conditions?		
Are there locations where additional sediment controls could be installed?		
Are there locations where removing existing sediment controls could be considered?		

Erosion Control

Check Dam:
- ☐ Straw Bale
- ☐ Rock
- ☐ Coir Log

Re-vegetation:
- ☐ Hydro-seed (estab.)
- ☐ Terra-seed
- ☐ Sod
- ☐ Seeding (estab.)
- ☐ Natural
- ☐ Turf Reinforcement Mat
- ☐ Erosion Control Blanket
- ☐ Scarification
- ☐ Undisturbed Ground Cover
- ☐ Straw Mulch
- ☐

	Y/N	Comments
Are erosion controls installed per approved ESC Plan?		
Have all repairs and maintenance tasks identified in the previous report completed by the end of the week?		
Are there areas that require immediate soil stabilization (e.g., slopes and embankments)?		
Are there locations where additional erosion controls could be installed?		
Are there locations where removing existing erosion controls should be considered?		

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Additional Comments:

☐ Photos attached

Name of Inspector(s): _____

Name of Environmental Monitor: _____

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Appendix D
KMKNO Ancestral Remains Protocol

Memorandum

November 7, 2017

To:	Angela Swaine (NS Lands)	Ref. No.:	11148275
From:	Christine Skirth/Peter Oram/al/010	Tel:	613-297-7687
CC:			

Subject: Emergency Protocols for the Discovery of Archaeological Resources and Human Remains

1. Archaeological Resources

In the event that archaeological resources are encountered during ground disturbing activities, the following procedures need to be followed in order to comply with the Special Places Protection Act:

1. Cease work in the area and notify personnel to stay clear of the findspot. Secure the area.
2. Contact a site supervisor.
3. Contact the consultant archaeologist (Cultural Resource Management Group: 902-453-4972).
4. Leave the findspot as-is. No more work is to continue in the area.
5. Do not remove any material from the findspot.

2. Human Remains

In the event that suspected human remains or a suspected burial is encountered during ground disturbing activities, the following procedures need to be followed in order to comply with the Cemeteries and Monuments Protection Act:

1. Cease work in the area and notify personnel to stay clear of the findspot. Secure the area.
2. Contact a site supervisor.
3. Contact 911 and indicate that human remains or a suspected burial has been found.
4. Contact the consultant archaeologist (Cultural Resource Management Group: 902-453-4972).
5. If the human remains are suspected to represent Mi'kmaw ancestors, contact KMKNO's staff archaeologist (Heather MacLeod-Leslie 902-956-4247) in accordance with the KMKNO Ancestral Remains Protocol (Provided in Attachment A).

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GHD
45 Akerley Boulevard Dartmouth Nova Scotia B3B 1J7 Canada
T 902 468 1248 F 902 468 2207 W www.ghd.com

REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

6. Leave the findspot as-is or, if threatened by disturbance from rainfall or debris from strong winds, protect by covering with a clean tarp or a plastic sheet (making sure not to place any weight on the finds). No more work is to continue in the area.

7. Do not remove any material from the findspot.

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Attachment A
KMKNO Ancestral Remains Protocol

Principles of Mi'kmaw Ancestral Remains Protocols

These are to be used to guide all matters relating to Mi'kmaw ancestral remains

Basic Principle

Ancestors should be left to rest and their remains should not be disturbed.

This is the foundation of all policies and procedures developed by the Mi'kmaq of Nova Scotia regarding ancestral remains.

Guiding Principles

1. Mi'kmaq are the authorities regarding the care and control of the remains of Mi'kmaw ancestors.

   All L'nu'k in Mi'kma'ki, including Ancient People, are considered Mi'kmaw ancestors. Their care is a responsibility of the Mi'kmaq.

2. Remains include remains of individuals, their graves and their burial sites.
3. The Lead Chief of the Culture, Heritage and Archaeology Portfolio is the Assembly-appointed Chief responsible for matters involving Mi'kmaw ancestral remains.
4. If suspected remains of Mi'kmaw ancestors are encountered, non-Mi'kmaw discoverers are asked to immediately contact the Staff Archaeologist at KMKNO on behalf of the Assembly of Nova Scotia Mi'kmaq Chiefs, who will immediately inform the Lead Chief of the Culture, Heritage and Archaeology Portfolio to determine next steps.
5. No material removal is to occur prior to contacting the KMKNO unless the remains are in imminent danger of loss or destruction. Material removal from its place of discovery, if deemed necessary according to preceding sentence, must happen in a respectful and honourable manner.
6. If material has been removed, place in red fabric (such as felt) bundle tied with red string. Place bundles in a birch bark container if available. Make a tobacco offering (loose tobacco) in birch bark container, or in red bundles, if no birch bark container immediately available. Await feedback from KMKNO.
7. No testing or invasive procedures shall be carried out, unless deemed acceptable by the Assembly of Nova Scotia Mi'kmaq Chiefs in accordance with the guidance of their Elders and communicated through their designate.

KMKNO, Staff Archaeologist Contact Information:

Heather MacLeod-Leslie, PhD
heathermacleod-leslie@mikmaqrights.com
O: 902-843-3880
M: 902-956-4247

"Confidential, privileged and under the protection of the February 23, 2007 Mi'kmaq-Nova Scotia-Canada Framework Agreement."

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Project Environmental Protection Plan

Project Environmental Protection Plan

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Nova Scotia Lands Inc.

This document is in draft form. A final version of this document may differ from this draft. As such, the contents of this draft document shall not be relied upon. Author disclaims any responsibility or liability arising from decisions made based on this draft document.

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Project Environmental Protection Plan

Boat Harbour Remediation Project
Pictou Landing, Nova Scotia

Revision History

Version	Revision Date (dd/mm/yy)	Revision Notes
1.0	1 October, 2020	Initial Draft

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Executive Summary

Boat Harbour, formerly known as A'se'k in Mi'kmaq, was originally a tidal estuary connected to the Northumberland Strait in Nova Scotia. The Province of Nova Scotia (Province) constructed the Boat Harbour Effluent Treatment Facility (BHETF) in 1967 to treat effluent from industrial sources including a bleached Kraft Pulp Mill (Mill). Its construction included reconstructing the natural tidal estuary into a closed effluent stabilization basin.

Following approvals, the Province will remediate Boat Harbour and lands associated with the BHETF, and restore Boat Harbour to a connected tidal estuary. The existing causeway along Highway 348 and the dam will be removed and replaced with a bridge to permit boat access to Boat Harbour. As part of the remediation and restoration work, hazardous and non-hazardous waste-bearing sediment from the BHETF will be removed and stored -in the improved waste containment cell located adjacent to the BHETF, on lands owned by the Province.

The Boat Harbour Remediation Project (BHRP or the Project) spans from the wastewater effluent pipeline from the first standpipe on the Kraft Pulp Mill property, through existing and historic BHETF lands, Boat Harbour and its banks, extending to Northumberland Strait, and Pictou Landing First Nation (PLFN), located between Boat Harbour and Northumberland Strait.

The BHRP is regulated by the Impact Assessment Agency of Canada (IAAC) under Section 16(d), of the Regulations Designating Physical Activities that states the Project triggers *CEAA*, 2012. This Project Environmental Protection Plan (PEPP) has been prepared by GHD Limited (GHD) for the BHRP in accordance with the project Environmental Impact Statement (EIS) for the Project.

This PEPP builds on the Environmental Management Plan (EMP), prepared under separate cover, and provides an overall comprehensive strategy for the protection of the natural environment throughout the Project. The PEPP provides a framework that facilitates further task specific development at the detailed construction stage of the Project through both the Site-Specific Environmental Protection Plans (SSEPPs) and health and safety protocols. The PEPP provides specific mitigation measures to be employed by the Contractor(s) during the Project and the commitment and efforts to be undertaken to avoid, manage and minimize potential environmental impacts.

This version of the document has been prepared while the EIS is under review, and permit applications are either in progress or the Project is waiting for further definition on requirements from regulators before preparation. Review and update will be required based on finalized EIS, permits, and approvals.

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Table of Contents

DRAFT

DRAFT

DRAFT

Figure Index

Table Index

Appendix Index

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List of Acronyms

ASB	Aeration Stabilization Basing
BH	Boat Harbour
BHETF	Boat Harbour Effluent Treatment Facility
BHRP	Boat Harbour Remediation Project
BHSL	Boat Harbour Stabilization Lagoon
BMP	Best Management Practices
CA	Contract Administrator
CALA	Canadian Association for Laboratory Accreditation
CC	Containment Cell
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
CM	Construction Manager
CMOC	Construction Management and Oversight Services Consultant
COC	Contaminants of Concern
DFO	Department of Fisheries and Oceans Canada
EA	Environmental Assessment
ECCC	Environment & Climate Change Canada
EEM	Environmental Effects Monitoring
EIS	Environnemental Impact Statement
EM	Environmental Manager
EMP	Environnemental Management Plan
EPP	Environmental Protection Plan
ESC	Erosion and Sediment Control
FDBMP	Fugitive Dust Best Management Program
FML	Flexible Membrane Liner
GCL	Geosynthetic Clay Liner
GHD	GHD Limited

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GHG	Greenhouse Gas
GNS	Government of Nova Scotia
ha	Hectares
HADD	Harmful Alteration, Disturbance, or Destruction of fish habitat
HASP	Project Health and Safety Plan
HC	Health Canada
HDPE	High-Density Polyethylene pipe
HHERA	Human Health and Ecological Risk Assessment
IA	Industrial Approval
IAAC	Impact Assessment Agency of Canada
ISC	Indigenous Services Canada
km	Kilometre
L	Litre
LFG	Landfill Gas
LTM	Long-term Monitoring
m	Metre
m^3	Cubic Metre
MBBA	Maritime Breeding Birds Atlas
MBCA	Migratory Birds Convention Act
mg	Milligrams
Mill	Kraft Pulp Mill
mm	millimeters
MSDS	Material Safety Data Sheet
NAPS	National Air Pollution Surveillance
NSLI	Nova Scotia Lands Inc. or Proponent
NSE	Nova Scotia Environment
NS DLF	Nova Scotia – Department of Lands and Forestry
NS TIR	Nova Scotia Department of Transportation and Infrastructure Renewal
NTU	Nephelometric Turbidity Units

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OBS	Optical Backscatter
PEPP	Project Environmental Protection Plan
PLFN	Pictou Landing First Nation
PM_{10}	Particulate Matter with Aerodynamic Diameter less than or equal to 10 microns
$PM_{2.5}$	Particulate Matter with Aerodynamic Diameter less than or equal to 2.5 microns
QA/QC	Quality Assurance/Quality Control
QMP	Quality Management Plan
ROW	Right of Way
SAR	Species at Risk
SARA	Species at Risk Act
SB	Settling Basins
SCADA	Supervisory Control and Data Acquisition
SMP	Spills Management Plan
SOCC	Species of Conservation Concern
SSEPPs	Site-Specific Environmental Protection Plans
TDS	Total Dissolved Solids
TLTS	Temporary Leachate Treatment System
TSP	Total Suspended Particulate
TSS	Total Suspended Solids
TVOC	Total Volatile Organic Compound

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Preface – Maintenance of the PEPP

The Project Environmental Protection Plan (PEPP) is specifically designed to be revised to meet the changing environmental protection needs of the Project. Maintenance of this PEPP will be the responsibility of the Construction Management and Oversight Consultant (CMOC) EM.

The responsibilities of the PEPP Coordinator are detailed in Section 2.2 of this PEPP, and include providing the most current version of the PEPP to the PEPP Users, which may include staff, applicable regulating agency representatives, construction contractors, municipalities, and other interested stakeholders.

The responsibilities of the CMOC EM are detailed in Section 2.1 of this PEPP, and include the timely review and approval of Site-Specific Environmental Protection Plans (SSEPPs) revision requests, and the review of PEPP content and PEPP revision requests on an annual and as needed basis.

Initiating PEPP Revision

PEPP Holders may request revisions to this PEPP, or revision addendums for Site-Specific purposes, by forwarding recommendations to the PEPP Coordinator. Site-Specific revision requests will be forwarded immediately to the CMOC and Nova Scotia Lands Inc. (NSLI) and if approved, will be addressed as an addendum to this PEPP.

PEPP Revision Procedures

Concurrent with NSLI Contract Specifications Review, PEPP contents and revision requests will be reviewed on as need basis by the CMOC EM. The person requesting the revision will be notified of the acceptance or rejection of the revision request. Approved PEPP revisions will be conducted in concert with any related revisions to the Contract Specifications in order that both remain consistent.

Revisions distributed by the PEPP Coordinator will be accompanied by a Control Sheet that provides the revision instructions and lists the sections being superseded.

An updated Table of Contents, included with the revision, will indicate the current status of each section within ten working days of receiving a PEPP revision. PEPP Users will:

- Read the text of the revision.
- Check the Control Sheet to ensure that all the listed pages have been received.
- Remove and destroy the superseded pages.
- Insert the revised pages in the proper place.
- Check the PEPP, using the updated table of contents to ensure it is complete and current.
- Enter the revision number and date entered on their Revision Control Record.
- Take action to incorporate the revision into the area of responsibility, through training or as otherwise appropriate.

Work-Specific EPP Addendums

Within 3 days of receipt of a Site-Specific revision request, the CMOC EM will review the request and respond to the revision request initiator with an approval or a rejection of the request. Approved

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requests will be acknowledged by an addendum to the PEPP which will be issued on a Site-Specific basis only. Only those PEPP Users involved in the activity(s) associated with the Site-Specific request shall receive the addendum. This PEPP will remain a requirement of the work, with the addendum taking precedence over the revised PEPP section(s) only. Once the subject activity(s) is complete, the Site-Specific addendum shall be discarded by the PEPP User. The original content of the PEPP once again is in effect.

Within two working days of receiving a SSEPP revision addendum, PEPP Users will:

- Read the text of the revision addendum.
- Check the Control Sheet to ensure that all the amended sections have been received.
- Take action to incorporate the revision addendum into the area of responsibility, through training or as otherwise appropriate.

Repeated Site-Specific requests to address the same issue may prompt the CMOC EM to initiate a PEPP revision.

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1. Introduction

The Province of Nova Scotia have committed to remediate the former Boat Harbour Effluent Treatment Facility (BHETF), a project to be managed and implemented by Nova Scotia Land Inc. (NSLI/the Proponent). The purpose of the Boat Harbour Remediation Project (the Project or BHRP) is to remediate Boat Harbour, and lands associated with the BHETF. The goal of the Project is to return Boat Harbour to a tidal estuary, which necessitates the remediation of contaminated sediments within Boat Harbour. Through the Project, it is Pictou Landing First Nation's (PLFN) desire and vision that Boat Harbour, (known to PLFN as A'se'k) be remediated and eventually be naturally restored to allow the community to re-establish its relationship with the water and land of A'se'k.

This Project Environmental Protection Plan (PEPP) has been prepared by NSLI for the BHRP in accordance with the Environmental Management Plan (EMP) and Environmental Impact Statement (EIS) for the Project. The PEPP is a living document that ensures that the Project will be reflective of legislative and environmental responsibilities but is sensitive to any changes that might arise during its implementation. The PEPP is, in effect, a framework that warrants further development at the detailed construction stage of the Project through both the Site-Specific Environmental Protection Plans (SSEPPs) and health and safety protocols. The PEPP provides specific mitigation measures to be employed by the Contractor(s) during the remediation process of the BHETF to maintain the integrity of the natural environment within the Site limits and for the protection of human and ecological health. As the proponent, NSLI has completed the PEPP prior to submitting an application for Part V Approval(s) under the *Environmental Act* (Government of Nova Scotia [GNS], 1995a) to conduct remediation work. As the PEPP is a living document, it is therefore updated on a routine basis to address situations that may not have been identified in the original design.

The main components of the BHETF include the wastewater effluent pipeline (over 3 kilometres [km] in length) that extends from the Kraft Pulp Mill (Mill) eastward, underneath the East River, to the BHETF property, Settling Basins (SB) and an Aeration Stabilization Basin (ASB) west-southwest of Boat Harbour (BH), and Boat Harbour Stabilization Lagoon (BHSL). Effluent from BH discharges through a dam (northeast of BH) into an estuary before being released to the Northumberland Strait. Prior to the construction of the SB and ASB, effluent was routed by open ditch from the pipeline on the east side of Highway 348 to natural wetland areas (Former Ponds 1, 2, and 3) before being discharged into BHSL. The existing Containment Cell (CC), located on provincially owned lands southeast of the ASB will also be used and closed as part of the Project. The area encompassing these features are referred to throughout this report as the Site Study Area or "Site". The BH Remediation Project Site and key features are shown on Figure 1.1.

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Figure 1.1 Boat Harbour Remediation Project Site

1.1 Project Overview

As part of the remediation work, the existing causeway along Highway 348 and the Dam will be removed and replaced with a bridge to allow return to tidal conditions and permit boat access to Boat Harbour. Construction activities will be directly contracted by NSLI, with oversight by the Construction Management and Oversight Consultant (CMOC). Along with the PEPP and Contractor(s) designed SSEPP(s), this PEPP is an integral part of the Environmental Management Plan (EMP). Accordingly, the Project EMP provided under separate cover, and this PEPP, serve as umbrella that will be contractual documents to all contractor(s) to guide environmental protection aspects of all relevant Site activities during the Project. The development and maintenance of environmental management planning initiatives are an integral part of the scope of work. This includes environmental effects monitoring (EEM) programs and mitigative measures and follow-up monitoring plans; in addition to an overall Project Health and Safety Plan (HASP) which will be prepared by the CMOC and the Contractor's HASP which will be prepared by the Contractor(s).

NSLI recognizes that certain specific work may require environmental protection procedures that are in addition to, or differ from, the components of this PEPP. These requirements will be determined from the project review during the Permitting Process or identified by work or Environmental Management personnel. It is expected that the Contractor(s) retained to complete the physical remediation and closure work on the Project will be required to develop SSEPPs for the Project components for which they are responsible. These SSEPPs will detail the relevant Best Management Practices (BMPs) mitigation measures, monitoring requirements, and reporting. These stand-along plans will be developed prior to the start of construction works and amended throughout the Project and any amendments will be subject to the review by the CMOC and acceptance by NSLI to ensure compliance with the overall plan. This PEPP will be updated with the appropriate information based on the environmental conditions at the Site, as project detail changes and with EMP and SSEPPs.

1.2 Purpose of the PEPP

This PEPP provides an overall comprehensive strategy for the protection of the natural environment throughout the course of all Project remediation activities. The PEPP is a strategic environmental framework that facilitates further development at the detailed construction stage of the Project through more element-specific environmental documentation (i.e., detailed contractor designed SSEPPs and Contractor-designed HASPs). The PEPP includes all the general construction and mitigative measures found in the SSEPPs, plus additional EEM Programs.

This PEPP forms an integral component of all work to be done by or for NSLI, or under the oversight of the CMOC.

The PEPP will:

- Provide concise and clear instructions regarding procedures for protecting the environment and minimizing potential environmental effects.
- Document environmental concerns and appropriate protection measures associated with work conducted by the GC, subcontractors, and CMOC.

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- Provide a reference document for planning and/or conducting specific activities which may have an effect on the environment.
- Function as a training document/guide for environmental education and orientation.
- Communicate changes in NSLI environmental program through the PEPP revision process.

The PEPP will complement the General Provisions and Contract Specifications for the remediation works.

PEPP Users are NSLI personnel, and all others conducting work on the Project by or for NSLI are required to comply with the procedures and methods contained herein. PEPP Users are include all persons or companies conducting work for NSLI under contracts.

Copies of the PEPP will be distributed to NSLI management, Contractor(s), CMOC and supervisory personnel, consultants, contractors performing work and other groups or agencies authorized to perform the work.

2. Roles and Responsibilities for Implementation of the PEPP and SSEPPs

2.1 CMOC Environmental Manager

Responsibilities of the CMOC Environmental Manager (EM), under the accountability of the NSLI for this PEPP include:

- Review and approve SSEPP amendments request in a timely manner.
- Conducting a full review of the PEPP on a minimum annual basis, and review revision requests to ensure that the recommended environmental protection procedures are current and complete.
- Liaise with an employee of NSLI who is in direct charge of the On-Site work (hereinafter referred to as Responsible Person) and assist the Responsible Person in ensuring the environmental compliance is being enforced
- Conduct compliance inspections to ensure requirements of the PEPP/SSEPP are being achieved.
- Act as liaison between regulatory authorities and NSLI for work activities.
- Chair weekly meetings, prepare minutes, perform and report on quality audits.
- Enforce the PEPP/SSEPP through issuance of orders for non-compliant activities.

2.1.1 PEPP Coordinator

Unless the duties are specifically delegated to another person, the CMOC EM will act as the PEPP and SSEPPs Coordinator. The CMOC EM will be responsible for inspection and monitoring of operation of all applicable environmental protection measures, as well as any compliance monitoring

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until completion of the Project or such a time as all conditions are met. Monitoring frequency will be in accordance with the requirements as presented by NSLI in the Request for Proposal; environmental monitoring will be conducted for turbidity, noise, dust and air quality at a minimum, and any other parameters determined by regulatory agencies. Daily reports will be submitted to NSLI via the CMOC. The CMOC will provide review, auditing, and consolidation of reporting from the Contractor(s) EM and staff.

Responsibilities of the Contractor(s) EM will include:

- Training for personnel, including Contractor(s), sub-contractors, to ensure proper implementation of the PEPP and SSEPPs
- Distribute copies of the PEPP and SSEPPs.
- Maintain an up-to-date list of all PEPP/SSEPP holders.
- Keep a record of all PEPP and SSEPPs revision requires and present them to the them to CMOC.
- Immediately forward addendums for approved SSEPP revision requests to affected PEPP Holders.

2.1.2 Training Requirements

PEPP Users must be trained to become familiar with the procedure described herein. Training of personnel will be conducted by the CMOC. The CMOC will be responsible for designating an on-site EM with knowledge of environment compliance and regulations. The CMOC EM, will be responsible for ensuring that all Contractor(s) and subcontractor(s) personnel are provided with Awareness Training on the PEPP prior to work commencing. Contractor(s) are responsible to provide training on the SSEPP requirements and procedures.

2.2 Contractor(s)

The Contractor(s) is in direct charge of the On-Site work. The responsibilities of the Contractor(s) under the PEPP includes:

- Each contractor will be required to develop SSEPP(s) and submit to CMOC for approval. Contractor SSEPPs will be used in conjunction with the PEPP.
- Retain overall responsibilities for the work's environmental management and On-Site implementation of the SSEPP for work under their charge.
- Facilitate training for the implementation of the SSEPP in coordination with the CMOC.
- Comply with all relevant regulations, authorizations and approvals.
- Initiate SSEPP revision requests if required.
- Be responsible for the day to day field monitoring.
- Enforce the SSEPP through implementation of non-compliant orders as required.

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2.2.1 Training Requirements

-Contractors are responsible for implementing, enforcing and maintaining their activities in accordance with the EMP, PEPP associated SSEPPs for the duration of their contractual activities at the Site, and for providing task-specific training requirements, information and BMPs to be incorporated into the SSEPPs. The following will be included in the training program:

- Communication of NSLI's commitment and obligations to the PEPP.
- Work description with discussion of the individual activities and the particular environmental concerns associated with each activity.
- Instruction on the specific environmental protection procedures for the work.
- Maintenance of the SSEPP.
- Communication procedures to report any unplanned events requiring emergency response.
- Enforcement of the PEPP/SSEPP.

2.3 Enforcement

The CMOC EM will be responsible for the day-to-day compliance monitoring and for ensuring that the PEPP/SSEPP is implemented. The CMOC EM will liaise with the Contractor(s) EM and confirm that compliance with the PEPP/SSEPP and other permits is being achieved. The CMOC EM has the authority to make recommendations to remedy insufficient environmental procedures, or if need be, to make recommendations to the NSLI to have the work, or a portion of the work, suspended.

Where the insufficient protection poses no immediate threat to the environment, the necessary remedies shall be implemented to the satisfaction of the CMOC EM within 24 hours from receipt of notification of the circumstances. Failure to meet this requirement can result in suspension of the work, or a portion of the work, by the CMOC EM through the issuance of non-compliant order.

In circumstances where insufficient environmental protection, ongoing work activities or Site conditions do pose an immediate threat to the environment, either the work can be suspended immediately, or immediate action to remedy the situation can be ordered, whichever is deemed appropriate by the CMOC EM.

Any suspension of work will be coordinated with NSLI -it will be issued by the CMOC EM as a non-compliant order for that specific non-compliant activity. After a non-compliant order has been issued, work may re-commence once the Contractor(s) completes measures to correct the non-compliance, to the satisfaction of the CMOC EM.

The CMOC EM will act as a liaison between NSLI and other Provincial and Federal regulatory bodies responsible for environmental protection. Site-Specific issues/request raised by such other bodies for consideration of changes to the work, and the beneficial environmental effects resulting from the changes. Additionally, issues raised will be considered for future incorporation into the PEPP.

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3. Project Components and Activities

The Project encompasses the remediation activities of Boat Harbour and lands associated with the BHETF. The ultimate objective of the remediation work is to restore Boat Harbour to a tidal estuary. The main components of the BHETF, includes the wastewater effluent pipeline that runs from the Mill and extends eastward, below the East River of Pictou (East River), to the BHETF property; SB and an ASB west-southwest of Boat Harbour; and the Boat Harbour SL. Effluent from the BHSL discharged through a Dam (northeast of Boat Harbour) into an estuary before being released to the Northumberland Strait. Prior to the construction of the settling basins and ASB, effluent was routed by open ditch from the pipeline on the east side of Highway 348 to natural wetland areas (Former Ponds 1, 2, and 3) before being discharged into the BHSL.

To manage this complex remediation project, construction activities have been grouped into Project Categories and Project Components. The following Table 3.1 lists the individual Project Categories and Components and provides a brief summary of each.

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Table 3.1 Individual Project Categories and Components

Project Components	Activities Summary
Categories	
Waste Management	Solid waste generated during remediation will be disposed of in the existing 6.7 hectare (ha) CC. Vertical expansion of the CC will be required to accommodate the waste; and the CC will be further modified to enhance the base liner system and leachate collection system and facilitate placement and dewatering of the sludge/sediment in a one-step operation.
Dredging	Remediation of the BHETF will include dredging of the ASB, BHSL, wetlands, and estuary. Dredging will be completed in the wet, predominantly via hydraulic dredge. Dredged sludge slurry will be pumped through discharge lines to the sludge management area, located in the CC, where it will dewater within Geotubes® or equivalent.
Wetland Management	Ex-Situ remediation of potions of the wetland, all of BHSL and a portion of the estuary will require active remediation through dredging in the wet with Geotube® or equivalent dewatering.
Water Management	
Bulk Water Management	During active remediation of the BHETF, bulk water will be managed through natural attenuation with no physical or chemical treatment beyond that achieved through the use of the Geotube® dewatering process for dredged sludge/sediments.
Dewatering Effluent Management	Dewatering effluent is water generated from dewatering sludge/sediment using Geotubes® and effluent from the CC which has come in contact with waste. Geotube® dewatering operations will occur within the CC. Geotube® effluent will be collected and directed by discharge piping back to the BHSL in the areas being dredged, or into an area that has not been remediated. Through Geotube® dewatering, the effluent is pre-treated through chemical dosing and Geotube® filtration. The dewatering effluent then mixes with the bulk water and is managed through natural attenuation.
Leachate Management	All water that comes in contact with the waste will be managed as leachate. During the interim period, leachate will be directed from the CC to the stormwater management pond (which will be operated as a retention pond), prior to being conveyed to a Temporary Leachate Treatment System (TLTS) configured in the area immediately east of the CC.
Watercourse Management	Flow from watercourses into the active in-water work areas will continue, with the management practices for bulk water allowing for this through-flow (i.e., diversion and/or pump around)
Bridge at Highway 348	The causeway will be demolished/ decommissioned using mechanical means and replaced with a concrete girder bridge along the same alignment to return BH to tidal conditions and to allow for boat access to BH.

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Table 3.1 Individual Project Categories and Components

Project Components	Activities Summary
Infrastructure Decommissioning	
Decommissioning Pipeline – On Land and Under Water	The underwater portions of the pipeline will be decommissioned and abandoned in place. The section of pipeline on land from the shoreline of Indian Cross Point east up to the Highway 348 property line, adjacent to a historic Mi'kmaq burial ground will be removed completely, as requested by PLFN. The portion of the on land pipeline that goes under Highway 348 will be filled. The rest of the on land pipeline will be decommissioned and abandoned in place.
Treatment Buildings	Treatment buildings and smaller infrastructure will undergo a chemical sweep, cleaning, designated substance removal (if any), followed by demolition using mechanical means. Footing and foundations will be cut and buried. Only above-grade structures will be removed. The remedial approach consists of decommissioning and demolishing each building/structure and transporting waste materials for disposal or recycling. If an end use is identified for a building it will undergo inspection and repurposing.
Dam	The remedial approach involves the demolition of the dam structure, stabilization of the estuary embankment slopes and dredging of the channel to ensure the hydraulics are maintained throughout the channel.
Berms	Berm decommissioning will be completed using excavators to remove the berm material. This material will be hauled and temporarily stockpiled until soil sampling results confirm material to be clean fill or contaminated soil.
Remediation Infrastructure	
Water Supply (Drinking and Industrial)	The existing water wells On-Site associated with the BHETF will be decommissioned. Construction activities will not require potable water, except for consumption by staff. Industrial water is not anticipated to be required On-Site. BH water will be recycled and used for polymer preparation for treatment of the Geotube® dewatering effluent during dredging operations.
Site Access	Use of existing access roads; no alternative Site access roads will be explored for the Project. Access to the CC is via a single lane gravel roadway off the perimeter road along the southern bank of the ASB. Vehicle access to the CC will need to be upgraded to facilitate cell improvements, waste placement, construction of final cover, and post-closure monitoring and care including leachate management. This existing access road will be realigned and widened to facilitate vehicle access.

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Table 3.1 Individual Project Categories and Components

Project Components	Activities Summary
Permanent and Temporary Linear Infrastructure	Temporary linear infrastructure includes floating pipelines, booster pumping station, temporary power supply to several areas around the Site, wash down areas, and road improvements across existing berms. These components will be removed on conclusion of the works and any disturbed areas stabilized prior to demobilization from the Site. Temporary intake and discharge piping will also be constructed for the purpose of water supply and discharge, which will result in temporary overland piping reaching from BH up to various areas including the CC area. Permanent linear infrastructure improvements include the roadway access from the west side, installation of a precast span or culvert (to permit road traffic over as well as restore tidal influence and small boat/canoe traffic under), adjustment of access road grading, and installation of a truck turnaround to permit safe and easy access to the leachate collection point by truck. Permanent stormwater control measures such as swales, ditches, and pond will be incorporated into the area around the CC.
Energy Supply	Energy supply to the Site on the west side will be improved and extended to reach the CC. This extension is required to permanently power the leachate collection system and truck loading station. As well as power to construction trailers and water management pumps in the cell area. The existing power supply near the Pilot Treatment pad may also be used during remediation but will be decommissioned as part of the final remediation works. Dredging operations will be diesel powered.

The ultimate accountability for care and control of the Project components rests with NSLI as the Proponent. However, it will be the CMOC and the Contractor(s) who are responsible for the daily activities on the Site, including environmental controls and monitoring to ensure compliance with this PEPP, the EMP, the Contract Documents, and by extension all applicable permit and regulatory requirements.

3.1.1 Project Phase

Project activities will be completed in three phases; Site preparation and construction, operation and decommissioning and abandonment as outlined in the Final EIS Guidelines. Activities for each phase specific to each Project component are discussed below, however, not all phases apply to each Project component (appropriate rationale provided within subsequent subsections below).

Each project phase will be scheduled in order to adhere to relevant environmental legislation for the mitigation of impacts to wildlife. Further details with respect to specific timeframes is provided in Appendix C – Valued Components Mitigative Measures by Work Area. Additional scheduling requirements may be issued by the regulatory agencies through the Environmental Assessment (EA) Approval or Industrial Approval(s) (IA).

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3.1.1.1 Phase One - Site Preparation and Construction

To facilitate the extent of construction activities, multiple staging areas are required. Phase One of the construction sequencing will focus on establishing site controls and staging areas, including those used for equipment decontamination. Remediation of the existing infrastructure for sludge management (SB, raw effluent ditches and CC) will occur in preparation for the larger scale remediation, as well as and improvements to the existing CC will be made in this phase. Activities specific to Phase One are outlined below:

- Site Preparation and Controls
- Pipeline Cleaning and SB Initial Remediation
- Influent Ditch Remediation
- Water Level Controls Installation
- CC Modifications

3.1.1.2 Phase Two – Operation

Following the preparation of the SB to act as a stock pile location and the requisite improvements to the existing CC, dredging and remediation activities will commence. The Site has been divided into separate sub-areas and will be dredged and remediated sequentially, starting with the wetland locations, followed by the ASB, BHSL, and then the estuary. For each area, the clean cattail tops will be removed and stored separately from the contaminated waste. The remaining sludge and cattail roots will be pumped into the Geotubes® within the improved CC.

On completion of the dredging works, an interim cover will be placed on the CC to allow for a period of settling and leachate drainage. The leachate removed from the cell during this period will be treated via a Temporary Leachate Treatment System (TLTS).

The Phase Two operation components include:

- Wetlands Remediation
- ASB Remediation
- BHSL Remediation
- Estuary Remediation
- CC Interim Closure
- Temporary Leachate Treatment
- Final Sedimentation Basin Remediation and Berm Removal
- Temporary Infrastructure Removal and BHETF Infrastructure Decommissioning
- CC Consolidation Period
- CC Operation and Maintenance and Final Closure

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3.1.1.3 Phase Three – Decommissioning

The final phase will require the removal of the existing berms and the decommissioning of the effluent treatment facility buildings. The initial components of Phase Three overlap with the final stages of Phase Two. The removal of existing berms are considered part of Phase Three but will occur immediately prior to the placement of the CC interim closure.

Clean fill from the removed berms will be used On-Site for general grading. Any contaminated soils from the berms will be placed within the improved CC. Once in-water remediation works and bridge construction is complete, the Dam separating Boat Harbour from the estuary will be removed. After consolidation (anticipated to be one year), the final cover will be installed on the CC and the TLTS dismantled and removed. The Phase Three decommissioning and abandonment components include:

- Causeway Removal and Bridge Construction
- Dam Removal
- CC Closure and Post-Closure
- Landfill Gas Management

3.1.1.4 Post-Remediation

Post remediation includes the long-term monitoring plans, and the operation and maintenance of the CC, including hauling leachate in small quantities for Off-Site disposal. Post remediation components include:

- Landfill Gas Management
- Monitoring Programs
- Leachate Management
- CC Maintenance -

3.1.2 Sequencing of Project Activities

Sequencing and scheduling of construction activities are to follow the PEPP and BMPs as outlined under SSEPs for establishment of Site controls and completed in accordance with relevant permits and approvals. The schedule provided here is a general guide to the ordering of activities and may be subject to change based on Site conditions, timing of construction start, seasons and permits. Due to the large scale of the remediation efforts, these tasks are not strictly sequential and depending on nature of activity and current Site conditions, multiple tasks may be carried out at the same time. A timing schedule for all Site activities is outlined below (Figure 3.1). The Contractor(s) will prepare a further detailed schedule for each project component, for review, approval of staging concepts, and progress monitoring to NSLI via the CMOC.

The anticipated Project implementation schedule has an estimated duration -between 4 and 7 years. The remedial works will be generally sequenced from upstream to downstream through the three phases of the Project.

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Years	1	2	3	4	5	6	7	Ongoing
Site Preparation and Construction								
Site Preparation and Controls								
Pipeline Cleaning and Settling Basins Initial Remediation								
Influent Ditch Remediation								
Water Level Controls Installation								
Containment Cell Modifications								
Operation and Decommissioning								
Wetland Remediation								
ASB Remediation								
Boat Harbour Stabilization Lagoon Remediation								
Berm Removal								
Final Sedimentation Basin Remediation								
Containment Cell Interim Closure								
Temporary Leachate Treatment								
Causeway Removal and Bridge Construction								
Containment Cell Consolidation Period (2-4 years)								
Temporary Infrastructure Removal and BHETF Infrastructure Decommissioning								
Dam Removal								
Post--Remediation								
Containment Cell Operation and Maintenance and Final Closure								

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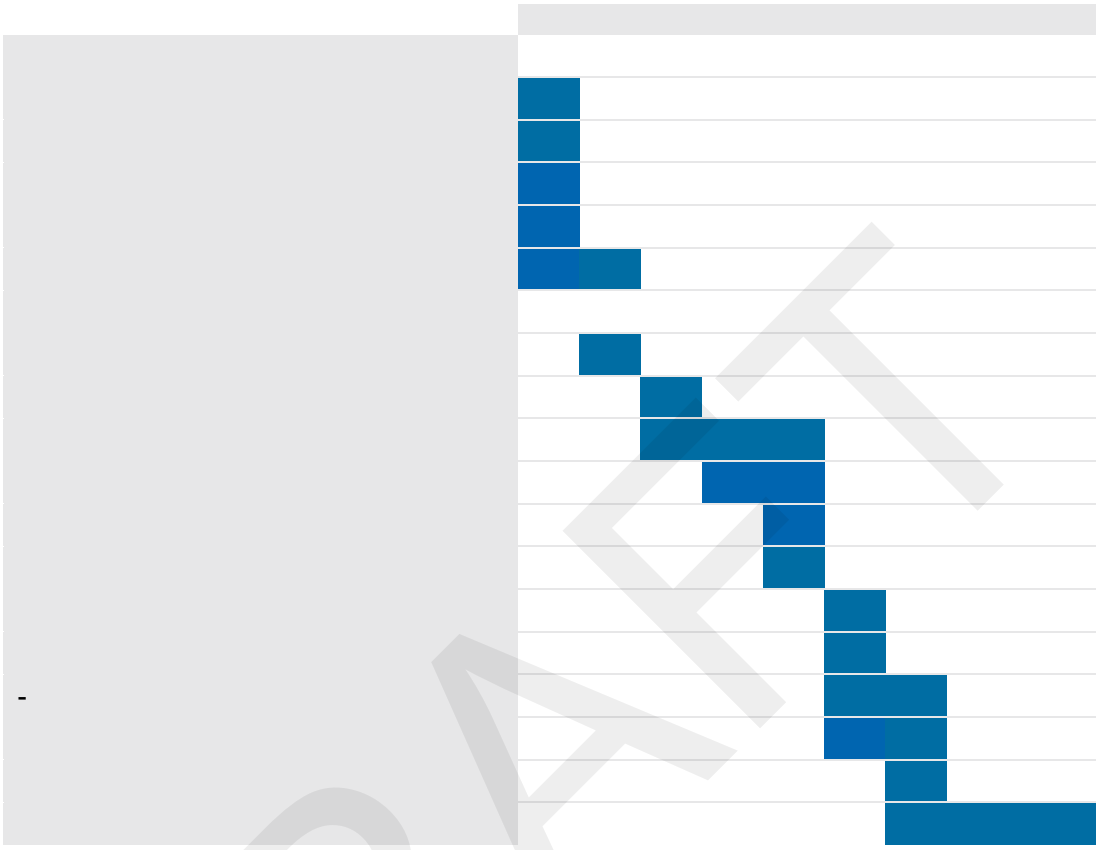

Figure 3.1 Boat Harbour Remediation Project Schedule

Seasonality and Frequency of Activities

All planned Project activities will be governed under the overall environmental assessment approval; however many activities will require separate approvals such as an Industrial Approval(s). The EIS describes planned Site activities; however, should deviations from the plans described in the EIS occur during Project implementation, separate approvals or amendments to existing approvals may be required. NSLI has spent over 5 years in the planning of the Project and has been in close contact with regulatory agencies and therefore has a high level of awareness of the requirements and the processes involved with obtaining the necessary approvals and any amendments. The knowledge gained through consultation with regulatory agencies has been carefully considered in the planning of the Project and will continue to be considered throughout the tendering, implementation and post remediation monitoring stages of the Project.

4. Environmental Permitting Processes

Based on the proposed construction activities a variety of environmental permits and approvals have been identified. Relevant information on the acquisition, status, and reasoning for anticipated federal and provincial permits and approvals are summarized in Table 4.1, Table 4.2, and Table 4.3, respectively.

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As noted in Section 2.1 of the EMP, prepared under separate cover, NSLI shall obtain all permits, authorization and/or approvals deemed necessary through these Legislative Acts and any other legislation as required.

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Table 4.1 Anticipated Federal Legislative and Regulatory Requirements

Project Components	Project Component Activity Description	Applicable Legislation	Agency	Required Approval or Permit	Responsibility
Entire Project	Access and all remediation activities on federal crown lands	• Indian Act (1985)	• Indigenous Services Canada (ISC) (in conjunction with PLFN Band Council Resolution)	• Approval is required for access and remediation activities on federal crown land from ISC in conjunction with PLFN Band Council Resolution. ISC has granted approvals for access to three Indian Reserve Lands adjacent to BH during the planning period and further approvals may be required for the remediation implementation, NSLI is working directly with ISC to determine the associated regulatory approval and compliance matters.	• NSLI is working directly with ISC to determine the associated regulatory approval and compliance matters.
Entire Project	All remediation activities	• Canadian Environmental Assessment Act, (CEAA, 2012) and Regulations; Migratory Birds Convention Act (MBCA,1994); Species at Risk Act (SARA, 2002); • Section 36(3) to (6) of the Fisheries Act[1] • Canadian Environmental Protection Act (1999)	• Impact Assessment Agency of Canada (IAAC) • Environment & Climate Change Canada (ECCC) • Health Canada (HC)	• Environmental Impact Statement (EIS) Approval and associated permits or exemptions.	• Fisheries permits will be applied for and obtained by the NSLI. • NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits.
Bridge construction at Highway 348 and estuary widening	Construction of a single-span concrete structure	• Canadian Navigable Waters Act (1985) • Fisheries Act (1985)	• Transport Canada (TC) • Fisheries and Oceans Canada (DFO)	• Navigation Protection Program Approval. • Authorization for work that may result in death of fish or harmful alteration, disturbance, or destruction (HADD) of fish habitat.	• Fisheries permits will be applied for and obtained by the NSLI. • Transport Canada permits related to Navigable Waters will be obtained by NSLI. • Highway Right of Way Permit will be applied for by the Contractor(s). NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits.
Waste Management	Handling and transportation of liquid and solid waste Off-Site	• Transportation of Dangerous Goods Act (1992) and Regulations	• TC	• Off-Site transport of waste materials classified under this Act - carrier must comply with all applicable regulations.	• No specific permits are anticipated for transportation of waste, but Contractor(s) will be required to comply with applicable regulations.
Infrastructure Decommissioning – Dam	Removal of earthen berm connecting the dam to the banks	• Canadian Navigable Waters Act (2019) • Fisheries Act (1985)	• TC • DFO	• Navigation Protection Program Approval. • Authorization for work that may result in death of fish or HADD of fish habitat.	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits. • Transport Canada permits related to Navigable Waters will be obtained by NSLI.
Sediment Management	BHETF components: Sludge removal, hydraulic dredging, and mechanical	• Canadian Navigable Waters Act (2019) • Fisheries Act (1985)	• TC • DFO	• Navigation Protection Program Approval. • Authorization for work that may result in death of fish or HADD of fish habitat.	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits.

[1] While DFO is responsible for administering the *Fisheries Act*, ECCC's is responsible for administering particular subsections of the *Fisheries Act, including* Section 36(3) to (6).

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Project Components	Project Component Activity Description	Applicable Legislation	Agency	Required Approval or Permit	Responsibility
	excavation from effluent ditching, twin settling basins, ASB and BHSL Estuary, if needed: Sludge removal, hydraulic dredging and mechanical excavation effluent and leachate pre-treatment, and discharge to estuary				• Transport Canada permits related to Navigable Waters will be obtained by NSLI.
Bulk Water Management and Dewatering Effluent Management	Water treatment and discharge of treated water to the estuary	• To be Determined	• ECCC	• Authorization for this specific discharge will need to be determined.	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits. • Transport Canada permits related to Navigable Waters will be obtained by NSLI.
Leachate Management	Off-Site hauling and disposal of leachate	• Transportation of Dangerous Goods Act (1992) and Regulations	• TC	• Carrier must comply with all applicable regulations.	• No specific permits are anticipated for transportation of waste, but Contractor(s) will be required to comply with applicable regulations.

Table 4.1 Anticipated Federal Legislative and Regulatory Requirements

Project Component	Project Component Activity Description	Applicable Legislation	Agency	Required Approval or Permit	Responsibility
Entire Project	Use of Crown Lands	• Crown Lands Act (1989)	• Government of Nova Scotia – Department of Lands and Forestry (NS DLF)	• Application for the Use of Crown Land	• NSLI is working with Nova Scotia Department of Lands and Forestry to determine the associated permits and approvals
Entire Project	Breaking ground	• Special Places Protection Act (1989)	• Department of Communities, Culture, and Heritage	• Category C Archaeological Resource Impact Assessment Permit may be required depending on conditions in Environmental Assessment Approval	• Contractor(s) is responsible for annually obtaining the required Category C Archaeological Resource Impact Assessment Permit may be required depending on location of disturbance
Entire Project	All remediation activities. (Note: a separate Industrial Approval [IA] will be obtained for waste management, see waste management activity below)	• Environment Act (1995) • Beaches Act (1989)	• NSE • NS DLF	• New Industrial Approval • Decommissioning of the BHETF including: - Decommissioning - Remediation - Wastewater treatment - Monitoring - Composting • A permit may be required where crossing a beach is needed or for removal of materials	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits • Contractor(s) will be responsible for any Beaches Act permits required for short-term access and works
Entire Project	Service connection/ modification for overall Site power	• Nova Scotia Power Privatization Act (1992)	• Nova Scotia Power (Emera Company)	• Service Connection	• NSLI is working with Nova Scotia Power to obtain the associated permits and approvals on behalf of the eventual owner of the services

Table 4.2 Anticipated Provincial Legislative and Regulatory Requirements

Table 4.2 Anticipated Provincial Legislative and Regulatory Requirements

Project Component	Project Component Activity Description	Applicable Legislation	Agency	Required Approval or Permit	Responsibility
Bridge construction at Highway 348	Construction of a single-span concrete structure	• Environment Act (1995) • Public Highways Act (1989)	• NSE • Transportation and Infrastructure Renewal	• Watercourse Alteration • Highway Right of Way Permit	• Contractor(s) is responsible for obtaining and complying with the Highway Right of Way permit
Bridge Construction at Highway 348	Service connection for lighting (NSTIR)	• Nova Scotia Power Privatization Act (1992)	• Nova Scotia Power (Emera Company)	• Service Connection	• NSLI is working with Nova Scotia Power to obtain the associated permits and approvals on behalf of the eventual owner of the services
Bridge Construction at Highway 348	Service connection for water main heat tracing (PLFN)	• Nova Scotia Power Privatization Act (1992)	• Nova Scotia Power (Emera Company)	• Service Connection	• NSLI is working with Nova Scotia Power to obtain the associated permits and approvals on behalf of the eventual owner of the services
Waste Management	Vertical expansion and enhancement of existing CC including temporary waste relocation, waste placement, and long-term leachate management	• Environment Act (1995) • Beaches Act (1989)	• NSE • NS DLF`	• An Amendment to the existing IA • A permit may be required where crossing a beach is needed or for removal of materials	• NSLI is working with NSE to determine the associated Industrial Approval permits
Wetland Management	Ex Situ remediation – de-watering of impacted wetlands in former settling ponds 1, 2, and 3 Excavation using land-based earthmoving equipment. Subsequent infilling, regrading, planting, and re-seeding	• Environment Act (1995)	• NSE	• Wetland Alteration Approval(s)	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits
Infrastructure Decommissioning – Pipeline on land	Remove residue from pipe, cap pipe	• Environment Act (1995) • Beaches Act (1989)	• NSE • NS DLF	• Include in IA for entire Project • A permit may be required where crossing a beach is needed or for removal of materials	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits
Infrastructure Decommissioning – Treatment buildings	Chemical sweep, cleaning, substance removal, potential demolition. Footing and foundations cut and buried	• Environment Act (1995)	• NSE	• Include in IA for entire Project	• NSLI is working with NSE to determine the associated Industrial Approval permits
Infrastructure Decommissioning - Dam	Demolished using mechanical equipment Removal of earthen berm connecting the dam to the banks	• Environment Act (1995)	• NSE	• Watercourse Alteration Approval	• NSLI is working with NSE to determine the associated Industrial Approval permits
Sediment Management	Sludge removal, hydraulic dredging and mechanical excavation from effluent ditching, twin settling basins, ASB, and BHSL	• Environment Act (1995)	• NSE	• Watercourse Alteration Approval • Wetland Alternation Approval • Include in IA for entire Project	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits

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Table 4.2 Anticipated Provincial Legislative and Regulatory Requirements

Project Component	Project Component Activity Description	Applicable Legislation	Agency	Required Approval or Permit	Responsibility
Bulk Water Management and Dewatering Effluent Management	Effluent and leachate pretreatment and discharge to estuary	• Environment Act (1995)	• NSE	• Water Allocation Approval	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits
Construction of Leachate Management Infrastructure	Pump station construction	• Special Places Protection Act (1989)	• Department of Communities, Culture, & Heritage	• Category C Archaeological Resource Impact Assessment Permit may be required depending on conditions in EIS Approval	• Contractor(s) is responsible for annually obtaining the required Category C Archaeological Resource Impact Assessment Permit may be required depending on location of disturbance
Leachate Management	Operation of long-term leachate management system (holding and haulage)	• Environment Act (1995)	• NSE	• Include in IA for entire Project	• NSLI is working with NSE to determine the associated watercourse alteration and Industrial Approval permits

Table 4.3 Anticipated Municipal Legislative and Regulatory Requirements

Project Components	Project Component Activity Description	Applicable Legislation	Agency	Required Approval or Permit	Responsibility
Entire Project	Construction of new building(s) and demolition of existing treatment buildings and structures	• Municipal Government Act (1998)	• Municipal By-Laws of the Municipality of Pictou County	• A building permit will be required for the demolition works. • Adherence to the following Pictou Country by-laws will be required: - Building By-Law - Sewage and Sludge Licensing By-Law - Solid Waste Resource Management By-Law - Spring Road Weight Restriction By-Law	• Contractor(s) is responsible for obtaining a Building (Demolition) Permit and complying with the Pictou County applicable by-laws.

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5. Project Construction Activities and Mitigation Measures

General environmental mitigation measures applicable to Project Phases One through three are listed below including illustrations and drawings of specific protective measures in Appendix B:

- Work will comply with conditions outlined in the NSLI's approval-to-proceed and any associated municipal, provincial or federal permits/approvals.
- A 15 metres (m) buffer zone will be maintained around all watercourses/wetlands not under active remediation, unless otherwise directed by the NSLI.
- Work conducted in the vicinity of watercourses/wetlands will be conducted in a manner which minimizes erosion and sedimentation of wetlands/watercourses.
- Erodible soils will not remain exposed for longer than absolutely necessary. In areas where extensive erosion occurs (i.e., along steep slopes) or in environmentally sensitive areas, an active re-vegetation program will be implemented as soon as possible following disturbance to ensure repaid re-vegetation. If bare soil areas (including stockpiles) will be remain for greater than 30 days, the exposed soils will be covered or seeded with an appropriate temporary or permanent vegetative seed mix.
- Appropriate erosion control measures as outlined in Section 5.1 shall be installed prior to conducting work. Appropriate erosion control measures are to be reflective of the risk from the Site activities and may change throughout the Project phases.
- Work will be completed as soon as possible and will be suspended during and immediately after intense rainstorms and during periods of high runoff, when required.
- The area of disturbance will be limited to that which is absolutely necessary to conduct work.
- Environmentally sensitive areas will be identified prior to work operations so that these areas are protected and the limits of work are clearly delineated. All areas delineated with perimeter fencing indicate vegetation protection areas before work commences. These areas are off limits and no personnel or construction activities are permitted within these areas. Site staff are required to be trained in the Site procedures for tree protections, including acceptable limb and root pruning practices. Necessary means will be undertaken to ensure that work does not intrude on private property.
- Site staff are required to be trained in the consequences that invasive species can have on the environment, what local invasive species may be present on Site, and the corrective measures to be done in the event that a potential invasive species is identified. In addition, the Contractor(s) will review the mitigation measures that have been implemented to control the spread of invasive species as outlined in Section 5.2.4.
- Site staff are required to be able to identify potential Species at Risk (SAR) and in the event of an observation, follow the proper procedure for reporting a sighting as outlined in Section 5.2.3. SAR training will be provided by a Contractor(s) EM to all employees before they begin work

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On-Site. Reference sheets will also be posted in the office trailer to provide information on identification, photos, habitat and timing windows for all SAR that may occur On-Site.

- All wildlife observed in and around the Site must not be harmed and allowed to pass through the Site undisturbed. In the event that an animal finds its way within the active area of construction, all work activities must cease to prevent harming the animal, no individuals are permitted to chase the animal off of the Site, and no animals shall be fed. There will be a zero-tolerance approach to wildlife interactions on Site, and those not adhering to these requirements will be asked to leave the Site. The requirements for documentation of wildlife observed on/adjacent to the Site are outlined in Section 5.2.2.
- Site staff must be aware of the timing restrictions to work activities associated with fish wildlife. These are referred to as timing windows, which prohibit certain work activities from being carried out which allows wildlife to be undisturbed during potentially sensitive life history events (e.g., migration, nesting, breeding, spawning grounds, nursing, rearing, food supply etc.). The timing windows are relevant for the project scope and must be followed by all Site staff and subcontractors.

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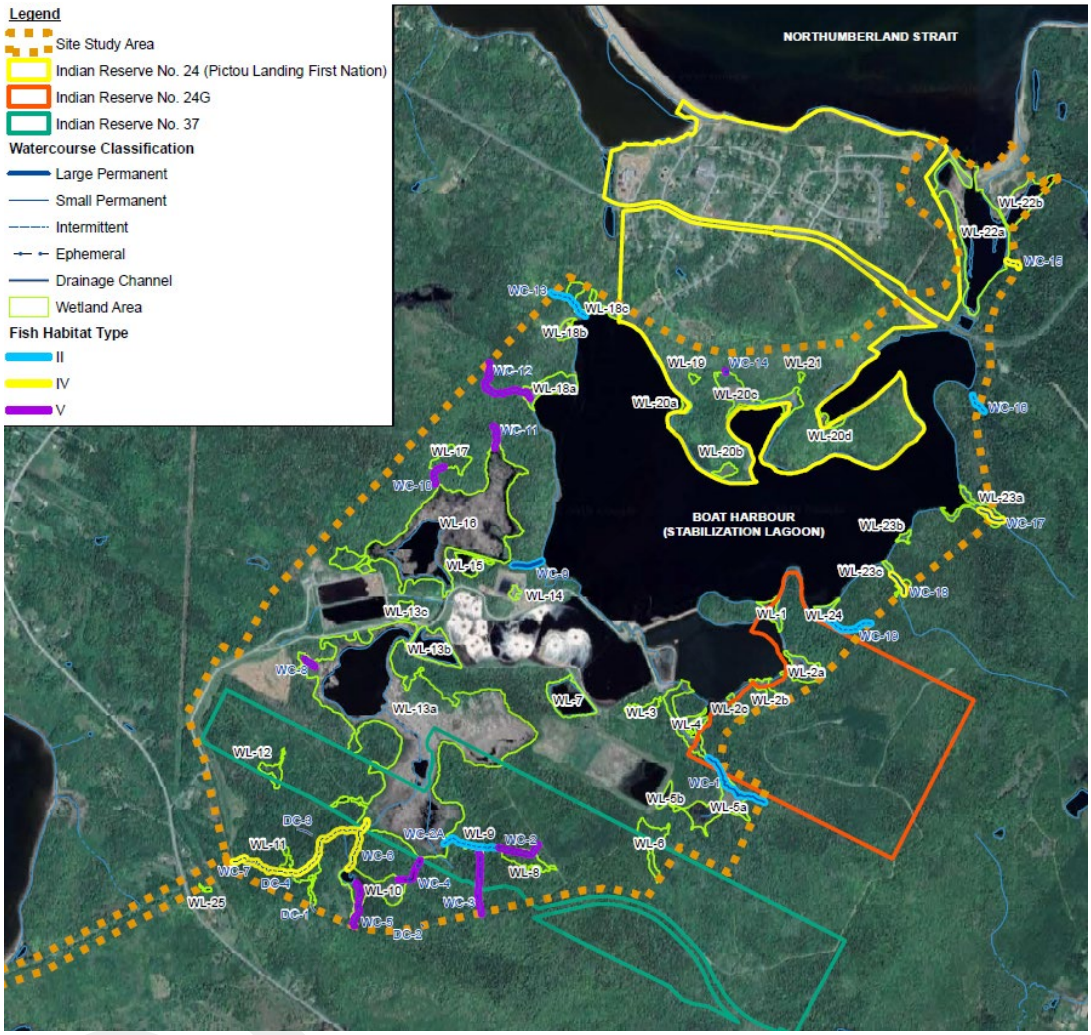

Figure 5.1 Boat Harbour Remediation Environmentally Sensitive Areas to be Delineated On Site

5.1 Erosion and Sediment Control Plan

Erosion and sediment control (ESC) measures will be implemented to minimize the erosion and sediment transport via water and wind. This is achieved primarily by controlling and diverting the flow of surface water run-off in a manner that prevents discharge into environmentally sensitive areas surrounding the construction area.

BHRP is a large and complex Site that is surrounded by and comprised of a number of environmentally sensitive features including wetlands, estuaries, watercourses and coniferous dominated forests. The low lying nature of the Site may provide additional challenges for the management of run-off during precipitation events. The Contractor(s) will implement ESC measures to provide confidence that the transport of sediment laden water or wind blown sediment will be controlled and not released into the surrounding environment.

The ESC strategies outlined in this PEPP are not static. As the construction and remediation activities progress and Site conditions change, so might the needs for additional ESC methods. The

prescribed methods may need to be upgraded or amended to suit the changing Site conditions. If it is determined that the current measures are not effectively controlling the release of sediment laden run-off, the activity must cease until alternative methods must be implemented immediately to minimize potential ecological impacts. To remain prepared, the Contractor(s) must maintain supplies (e.g., silt fencing, filtration socks, hay bales) on Site to allow for a quick response, should the need arise.

The Contractor(s) will control sediment at the Site to mitigate the impacts to surrounding environment using best management practices as outlined in *Watercourse Alteration Standard* (NSE, 2015), *Erosion and Sediment Control Handbook for Construction Sites* (NSE, 1988), the design drawings, specifications, and standardized approaches structured to each area, activity, and phase of construction. The GC will follow, as a minimum the controls listed below, in addition to any specifications listed in the detailed design package and be prepared to progressively increase the application of controls to meet the objectives of erosion and sediment control. In addition, the CMOC EM will be present during the establishment of Site controls to provide any additional guidance and identify potential areas of concern throughout construction.

5.1.1 General Environmental Mitigation Measures

General ESC mitigation measures are listed below:

- All relevant Site staff must complete Site-Specific ESC training and understand the need for and importance of proper ESC measures. Staff will also be given information on identifying and reporting deficiencies.
- All ESC measures must be installed and inspected under the guidance of the Contractor(s) EM and confirmed by the CMOC EM prior to work commencing within the area. ESC measures will isolate work areas as identified in the design drawings.
- Any deficiencies in control measures will be immediately corrected. The Contractor(s) will daily inspect remove and dispose of accumulated sediment and debris from sediment control measures in an environmentally acceptable manner to prevent entry of debris and sediments into the surrounding environment. Build-up of sediment and debris will not exceed 300 millimeters (mm).
- ESC fencing material must be free of any plastic netting materials to limit snare hazards for wildlife such as amphibians, snakes and turtles.
- The Contractor(s) must limit vegetative clearing to only when absolutely necessary and take care to avoid damage to freshly excavated areas, and where soils have been recently disturbed, so as not to generate sediment that could potentially migrate or become tracked Off-Site.
- Where space permits, a buffer of vegetated undisturbed land will be maintained to act as an additional barrier to sediment erosion between the environment and work areas. Contractor(s) are only authorized to work within the approved construction limits.
- A supply of heavy duty silt fence sufficient to replace or enhance existing structures will be maintained on Site at all times.

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5.1.2 Road and Access Controls

General environmental mitigation measures applicable to road and access controls are listed below:

- If needed, the control of dust will preferably be done by using water and when necessary by other types of suppressants.
- Clearing and grubbing of adjacent vegetation to access points and roads will be minimized to the extent feasible.
- Mud mats and controls to prevent tracking mud and sediment Off-Site will be implemented at all exits. The Contractor(s) will implement additional controls if sediment is excessively observed on municipal road by the Site exits.
- Snow plowing and storage will be conducted in a manner that prevents the input of sediment into environmentally sensitive areas during spring melt. The dumping of snow into any waterbody or environmentally sensitive area is not permitted.

5.1.3 Decontamination and Wash-down Areas

General environmental mitigation measures applicable to decontamination and wash-down areas are listed below:

- Heavy-duty silt fencing will be installed to function as an erosion control barrier around the perimeter of all decontamination and wash-down areas.
- Water will be used in a manner to efficiently decontaminate and clean equipment and to not produce excessive run-off.
- The Contractor(s) EM will assess each decontamination and wash-down area and make recommendations to the Contractor(s) on how to tailor the ESC design with the objective to divert run-off water away from environmentally sensitive areas. This may include but not limited to: check dams, hay bales, and filter socks.

5.1.4 Storage and Stockpile Areas

General environmental mitigation measures applicable to storage and stockpile areas are listed below:

- Stockpile areas will be graded gradually with a maximum slope of 3:1.
- All stockpiles, materials, equipment, and tools will be fully contained by sediment fencing in areas separated at least 30 m from any waterbody or wetland.
- Any stockpiles of erodible materials such as topsoil, will be kept securely covered when not in use.

5.1.5 In-Water Works

Detailed mitigation measures pertaining to near- and in-water works are provided in Section 5.7. The following mitigation measures will be implemented with focus to ESC for construction activities carried out in and around water:

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- Dual silt curtains will be used for dredging activities and installed in accordance to the design specifications.
- Silt curtains will remain in the water over winter and must be inspected and replaced as needed after ice has cleared and prior to any dredging activities.
- If erosion and sediment control measures malfunction or do not function as intended, all work must cease in the area immediately until the measures are assessed.
- Relevant staff will be made aware the permissible limits to in water works, including work in wetlands. All staff and equipment are only authorized to work within these limits.
- Equipment must be cleaned following any activity that results in mud accumulation to prevent to transport of sediment to other areas of the Site. Equipment may not be clean if it will be used for the same task, provided that it can be properly stored away from the waterbody without depositing mud throughout the Site.

5.1.6 Discharge of Water from Site

The Contractor(s) will follow the mitigation measures outlined herein and prepare a SSEPP for Water Management (with focus to ESC for discharging water from Site).

5.1.6.1 Groundwater

General environmental mitigation measures include:

- Develop and implement a SMP.
- Protection of groundwater will include both the prevention of contamination and potential changes to the down gradient water flow from construction activities.
- Monitoring protocols for perimeter groundwater wells for contaminants of concern.
- Construction of a pad to contain spills when pumping from the holding tank to tanker truck to haul leachate Off-Site.
- Plans to monitor and maintain leachate collection system within CC.
- Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs.

5.1.6.2 Surface Water

General environmental mitigation measures include:

- Use of silt curtains to control sedimentation.
- Control effluent discharge to estuary at the outlet control structure to respect the TSS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 milligrams/Litre (mg/L) from background level) or approved levels noted in the IA, confirmed by applying a TSS monitoring program.
- Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance; also, ensure contractors minimize travel across areas of exposed soil.

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- Develop and implement a SMP.
- Outline the Contractor's responsibilities and actions associated with the protection of clean water from wastewater.

5.1.7 Erosion and Sediment Control (ESC) Removal

ESC measures are required to be removed following the completion of the scheduled works in the work area. The following mitigation measures include:

- Areas in which work has been completed will be revegetated as soon as practical using native seeds and plants following the specifications for revegetation and planting.
- ESC measures will not be removed until the associated exposed areas have established sufficient vegetative cover to stabilize the soil.
- ESC measures associated with the temporary leachate treatment system will not be removed until the final cover for the CC is in place and vegetation has been established.
- All ESC materials removed from the Site will be properly disposed of Off-Site.

5.2 Vegetation Clearing, Disposal and Management

Vegetation clearing consists of the removal and disposal of all trees, shrubs, fallen timber, logs and other surface litter within the work area as directed and designated by the plans/drawings or the Responsible Person. Vegetation clearing may be required prior to the removal of soil during Site remediation works and/or road construction.

5.2.1 Environmental Mitigation Measures

General environmental mitigation measures applicable to vegetation clearing, disposal and management are listed below:

- Vegetation clearing will adhere to the *Migratory Bird Conservation Act* (MBCA) by avoiding clearing between April 15 to August 31 (Government of Canada) of any given year, to mitigate the risk to migratory birds. Where clearing between April 15 to August 31 cannot be avoided, the area to be cleared will be assessed via field surveys by an experienced biologist for breeding bird use and activity.
- Clearing will consist of the removal of all shrubs, debris and other perishable materials from the area indicated on the Contract Drawings, as well as cutting and disposal of only those standing trees required to complete the project. These trees will be cut off to a remaining height of not greater than 300 mm above the ground.
- All slash will be piled for subsequent disposal outside the buffer zone of a watercourse/wetland or any identified environmentally sensitive area and will be located so that it is not washed into a watercourse/wetland or other environmentally sensitive area during precipitation events or periods of high water.
- Watercourse/wetland crossings are to be avoided where possible, maintaining riparian and shoreline vegetation in place. Equipment is not permitted to enter a watercourse other than at approved fording locations approved through the NSLI.

DRAFT

- Non-merchantable timber, logs and brush shall be disposed of by chipping or storage for later reuse in accordance with Project documents. Chipped materials not identified for reuse will be disposed of at an environmentally approved disposal area.

5.2.1.1 Tree and Vegetation Protection

Mitigation measures that will be implemented to address potential effects to terrestrial habitat and vegetation, include:

- Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance.
- Minimize travel across areas of exposed soils.
- Vegetation management will be conducted by cutting (e.g., no use of herbicides).
- Manage dust emissions through the use of water, where applicable.
- To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.
- Any damage to trees as a result of operations should be triaged by a certified arborist using industry accepted best practices.
- Should any earthworks expose roots of trees that are not to be cleared, the roots should be trimmed under the direction of a certified arborist using industry best practices.

5.2.1.2 Vegetation Removal

Mitigation measures that will be implemented during the removal of vegetation include:

- Any additional vegetation clearing will be minimized to the extent possible and if required shall be undertaken outside the nesting period for migratory birds identified by NSE as April 15 to August 31; or alternatively, a breeding bird survey is conducted by a qualified professional to determine if probable, or confirmed breeding is taking place within 25 m of the Project footprint. If the Project area is considered by a qualified professional to have no probable or confirmed breeding, the vegetation removal may proceed within the timing window.
- Should Project activities occur during the breeding bird season, a nest survey should be conducted within 7 days of any Project activity occurring. Should a nest be identified, a buffer must be established and the nest is to be monitored.
- Monitor known nests near equipment or material stockpiles and exposed areas from a distance with a spotting scope or binoculars to verify the effectiveness of the buffer until the nests are inactive.
- Conduct routine inspections as directed by regulators. Inspections are anticipated to be conducted daily by operators, and as required by qualified avian experts during the remediation phase of the project and all other phases that interact with directly or in directly with those areas. All woody materials created shall be chipped or mulched On-Site and stored for revegetation as necessary.
- Limit vegetation clearing to approved areas. This is to be conducted by cutting, with no use of chemicals or herbicides.

DRAFT

5.2.1.3 Revegetation Plan

The revegetation of the Site shall be as detailed in the construction drawings. This shall be completed through:

- Mechanical or hydraulic seeding
- Shrub and tree planting
- Application of chipped and mulched vegetation

5.2.2 Wildlife Management

General environmental mitigation measures that will be implemented to address potential adverse effects to mammals including amphibians and reptiles include the following:

- Wildlife awareness training will be provided to all Site personnel during Site-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poaching activity within the vicinity of the BHETF.
- The CMOC will establish a wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information will be used to install signage, if appropriate, in areas with high wildlife sightings.
- Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on Site.
- Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contractor(s) and the Contractor(s) EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the Site. The wildlife should not be approached or handled. The Contractor(s) will contact NSLI (via the CMOC EM). Only a qualified professional should handle or relocate an animal.
- A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wildlife observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will be used to track wildlife activity throughout the BHETF, and this information can be used to install signage, if appropriate, in areas with high wildlife sightings.
- Should the animal be resident within the Site (remaining on Site longer than 24 hours), injured, or eggs/nests are observed, additional measures to avoid impacts may be required before work can restart. The Contractor(s) EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessment (EA) Staff regarding directions to proceed.
- Parking, laydown, and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated.
- Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers.

DRAFT

- Waste will be stored, handled and transported in accordance with the Site waste management plan. All waste is to be stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weather.
- The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this Project will lose Site privileges.

5.2.3 Species at Risk Management

There is potential for SAR to utilize the Site over the course of remediation. Table 5.1 provides a list of SAR that have been previously observed within or in the vicinity of the Site during preliminary studies. However, this is not an exhaustive list for SAR that may be encountered. It is the responsibility of the Contractor(s) EM to be aware of local SAR and educate all Site staff on key identifying characteristics and the correct actions to follow in the event that a SAR is observed on Site.

Table 5.1 Species at Risk Observed on Site

Species	Species
Black Ash (*Fraxinus nigra*)	Evening Grosbeak (*Coccothraustes vespertinus*)
Common Nighthawk (*Chordeiles minor*)	Canada Warbler (*Cardellina Canadensis*)
Eastern Wood-Pewee (*Contopus virens*)	Barn Swallow (*Hirundo rustica*)
Bank Swallow (*Riparia riparia*)	(Rainbow) Smelt (*Osmerus mordax*)
Atlantic Salmon (*Salmo salar*)	

In addition, it is noted that other SAR have suitable habitat near the Site such as piping plover (*Charadrius melodus melodus*), mainland population moose (*Alces americana*), and Canada lynx (*Lynx canadensis*).

The following mitigation measures, actions, and reporting obligations will be implemented to address potential adverse effects to SAR:

- Daily and on-going observations for SAR activity shall be undertaken by all personnel on Site. A poster/handout of SAR that could potentially be encountered, how to identify them, and the responsibilities of project personnel under the Species at Risk Act (SARA, 2002) will be provided by the Contractor(s) EM to familiarize Site personnel as part of Site training.
- Should SAR enter the construction zone, all work shall cease, and the species identified, if possible. The Contractor(s) and the Contractor(s) EM shall be notified and CMOC EM. Personnel will stand back and allow the animal to leave the Site. The SAR should not be approached or handled. The CMOC EM will contact NSLI. Only a qualified professional should handle or relocate an animal.
- A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wildlife observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will be used to track wildlife activity

DRAFT

throughout the BHETF, and this information can be used to install signage, if appropriate, in areas with high wildlife sightings.

- Should the animal be resident within the Site (remaining on Site longer than 24 hours), injured, or eggs/nests are observed, additional measures to avoid impacts may be required before work can restart. The Contractor(s) EM shall be notified for direction.
- Intact forest stands and wetlands will be avoided wherever possible during detailed Project planning and design in favor of previously disturbed areas (e.g., stands disturbed by timber harvesting, existing roads, or other development), especially those that are predominantly mature softwood, as several Species of Conservation Concern (SOCC) lichens utilize this type of habitat.
- Wildlife awareness training will be provided to all Site personnel during Site-Specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poaching activity within the vicinity of the BHETF.
- Fencing will be installed, where practical, to prevent wildlife from accessing areas with increased risk of injuries to wild species.
- Noise controlled by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible.
- Reduce light pollution On-Site by installing downward-facing lights for On-Site infrastructure and roads. Wherever possible, install motion-sensing lights to ensure lights are not turned on when they are not necessary.
- The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this Project is subject to disciplinary actions.

5.2.4 Invasive Species Management

Invasive species are exotic (non-native) species which are prone to rapid spread and establishment and cause damage to the environment, economy and/or human health. The Contractor(s) will commit to implementing mitigation measures to prevent the inadvertent spread of invasive plant species (e.g., from seeds or plant material adhering to dirty vehicles and equipment) during construction activities.

A number of invasive and/or exotic plant species have been identified within or in proximity to the work area, summarized in Table 5.2.

Table 5.2 Invasive and Exotic Plant List

Species	Species
Large Sweet Vernal Grass (*Anthoxanthum odoratum*)	Common Hawkweed (*Hieracium lachenalii*)
Belgian Orache (*Atriplex laciniata*)	Winter Ryegrass (*Lolium perenne*)
Yellow Rocket (*Barbarea vulgaris*)**	Purple Loosestrife (*Lythrum salicaria*)*
Smooth Brome (*Bromus inermis*)*	Common Apple (*Malus pumila*)

DRAFT

Table 5.2 Invasive and Exotic Plant List

Species	Species
Goosefoot (*Chenopodium pratericola*)	Common Timothy (*Phleum pratense*)
Wild Morning Glory (*Convolvulus arvensi*)	Marsh Pepper Smartweed (*Polygonum hydropiper*)
Queen Anne's Lace (*Daucus carota*)	Common Buttercup (*Ranunculus acris*)
Deptford Pink (*Dianthus armeria*)	Creeping Buttercup (*Ranunculus repens*)
Helleborine (*Epipactis helleborine*)	Watercress (*Rorippa nasturtium-aquaticum*)
Glossy Buckthorn (*Frangula alnus*)*	Colts Foot (*Tussilago farfara*)**
Smooth Bedstraw (*Galium mollugo*)*	Cow Vetch (*Vicia cracca*)
Meadow Crane's-bill (*Geranium pratense*)	
* Denotes invasive species. ** Denotes potentially invasive species.	

In order to avoid potential environmental impacts related to the presence and spread of invasive species, the following mitigation measures are proposed:

- The Contractor(s) will reference Ontario Clean Equipment Protocol for Industry – Inspecting and Cleaning Equipment for to prevent to spread of invasive species and/or the NS equivelant. All equipment and vehicles must be thoroughly cleaned and inspected prior to entering the Site. Any machinery that appears to have not been cleaned will not be permitted on Site.
- Any soil (fill or topsoil) imported to the Site shall be free of invasive species and noxious weeds. Proof of origin of imported soil will be provided to the Contractor(s) EM for acceptance a minimum of 1 week before being brought to Site.
- Clothing and footwear should be free of mud, dirt and vegetation prior to entering or leaving the Site.
- If an invasive species occurs and/or is removed completely (including roots) prior to fruiting or seeding of the plant, individuals will be disposed of appropriately, and removed Off-Site to ensure no further spreading occurs.
- Relevant on-site staff will be instructed on the identification of invasive species that may occur in the vicinity of the Site, common modes/methods to which invasive species spread (soil/plant material, dirty vehicles/equipment, etc.), and proper methods for preventing the spread of invasive species between worksites.
- Contractors will ensure all work is undertaken in compliance with the provincial Agricultural Weed Control Act and its regulations.

5.3 Grubbing, Stripping and Material Excavation on Land

Grubbing refers to the removal of all stumps, roots, rootmat, and other debris, while stripping refers to the removal of topsoil. Materials excavation refers to the excavation of all other soil materials as

DRAFT

included in earthworks, preparation of roadbed, Site development, trenches, drains, borrow from adjacent land or pits, intersections, private entrances, and other similar works.

5.3.1 Environmental Mitigation Measures

General environmental mitigation measures that will be implemented to address grubbing, stripping, and material excavation on land include the following:

- Where construction can be completed without grubbing and stripping, none shall occur.
- Grubbing shall be carried out for a distance not to exceed 1 kilometre (km) ahead of grading operations for linear portion of projects (i.e., access road improvements and Highway 348 bridge work).
- Grubbing will not be done at the base area of embankments that are 2 m or more in height, unless otherwise directed by the Contractor(s) EM or the CMOC EM.
- Topsoil and excavated overburden and bedrock will be stored in a separate stockpile, at environmentally approved locations, for later use in rehabilitation and backfilling, respectively.
- Dewatering of excavated areas will make use of measures to minimize and control the release of sediment-laden water through the use of filtration through vegetation, erosion control devices, sediment collection ponds, check dams or other devices.
- Ditching consists of excavation and grading to construct a new ditch or to re-establish an existing deteriorated ditch. Ditching is undertaken to affect drainage within the road right-of-way (ROW) and to correct deficiencies such as erosion, non-conformity in grade and restrictive vegetative growth that impedes drainage within the ROW.

5.3.1.1 Ditching Management

General environmental mitigation measures that will be implemented to address potential adverse effects from ditching activities include the following:

- Ditching shall proceed in the upslope direction.
- Where ditching takes place near a watercourse, no ditching shall be completed within 30 m of the watercourse/wetland unless directed by the conditions of the projects permits/approvals. Vegetation located in this 30 m buffer area acts to filter any sediment-laden runoff water prior to entering the watercourse/wetland.
- Within 48 hours of doing ditching work, or as directed by the Responsible Person, all exposed soils will be either seeded or receive straw/hay mulch application.
- Ditching shall not be done within sensitive breeding bird timing window (typically from April 15 or prior August 31) without written approval from the regulatory authorities.
- When ditching is approved within 30 m of a watercourse/wetland, the following schedule will apply:
  - Seed must be applied on exposed soils.
  - If ditching prior to June 1 or after September 30, mulch or an erosion control blanket (i.e., jute mat, erosion control mat) must be applied overtop of the seed.

DRAFT

- If, due to lateness of the season, seeding is not possible, the exposed soils shall be completely covered for "overwintering" with either mulch or an erosion control blanket. Then, early in the next growing season, the erosion control materials shall be removed, the area shall be prepared for seeding, and then seeded.
- The Contractor(s) EM and/or the CMOC EM will direct additional seeding or erosion control requirements within this 30 m zone as appropriate on a Site-Specific basis.

- A check dam shall be installed at the end of the ditch where it meets the undisturbed portion. Additional erosion control structures shall be installed further up the ditch as required or as directed by the Responsible Person or the Contractor(s) EM and/or the CMOC EM.
- Natural drainage will be maintained whenever practical.
- Ditches will be directed into surrounding vegetation where possible, or a sediment collection pond, rather than emptying into a natural watercourse/wetland.
- Depending on the erosion potential or to ensure stabilization, the ditch may be hay mulched, hand seeded, hydro seeded or lined with an erosion control mat (i.e., jute mat and/or vegetative erosion control blanket).
- Rip-rap or an erosion control blanket designed for high flows should be used to line the bottom of ditches that have steep grades and/or excessive erosion as directed by the Responsible Person or the Contractor(s) EM and/or the CMOC EM.
- Petroleum, septic wastes or otherwise contaminated material encountered in the ditch, shall be reported to the Contractor(s) EM or to the Canadian Coast Guard (CCG) Emergency Response as per Section 8.

5.4 Fill Placement & Grading

Fill Placement consists of placing soil and/or rock for Site development and construction purposes. This includes preparation and construction of roadbeds, embankments and slopes. Placing material in depressions to level surfaces helps to minimize ponding. Grading consists of shaping the unpaved road or Site surface and is used to stabilize a surface, improve surface drainage and to provide for runoff in a controlled manner.

5.4.1 Environmental Mitigation Measures

General environmental mitigation measures that will be implemented to address fill placement and grading include the following:

- When grassed areas are encountered during grading, every effort will be made to leave such grassed areas intact.
- Areas where little or no vegetation exists can be graded after a light rain when the surface is in an optimum state for compaction, but not after heavy rains which will promote runoff conditions.
- Where possible, a berm (windrow) will not be left at the edge of the road. Grading unpaved roads often results in the creation of a windrow along the edge of the road by the grader blade. The windrow will be collected and re-used in construction or properly disposed of Off-Site. In cases where this is not possible, diversions will be installed in the windrows at locations 30 m or

DRAFT

greater from the watercourse/wetland boundary, to allow surface water to drain into a ditch or vegetated area.

- The elevation of the infilled or graded area will be maintained higher that the ditch it is draining into.

5.5 Dewatering

Certain areas of access road improvements or Site remediation works, bridge construction, and infrastructure removal may require de-watering/works isolated from water.

5.5.1 Environmental Mitigation Measures

General environmental mitigation measures that will be implemented to address potential adverse effects to dewatering activities include the following:

- Protection measures and dewatering plans for activities not associated with the CC discharge (e.g., bridge construction, berm removal).
- Certain stages of the construction plan require that isolated areas be dewatered to allow work to be completed in the dry. The Contractor(s) will prepare a Water Management Plan (i.e., SSEPP) which will include a detailed dewatering plan that addresses all anticipated stages of construction and follows best management practices.
- Dewatering may also be required to maintain a dry work area in situations where water input is caused by seepage or precipitation.

The following mitigation measures will be followed and implemented into the detailed dewatering plan:

- The isolated areas for dewatering will be kept as small as possible while allowing for safe completion of the required construction activities.
- Where pumping is required from water known to contain fish, exclusion screens will be implemented on all intakes to prevent incidental harm to fish. Exclusion screens will follow DFO requirements and also function to prevent the movement of plant material and other debris.
- A fish rescue/salvage will be required prior to full dewatering of any isolated area. The Contractor may partially dewater an area to facilitate a fish rescue and/or test for leaks and measure seepage rates.
- Dewatering pump intake floats shall be installed on each pump intake to discharge 75 percent (or as much as possible until the SSEPP monitoring action point is achieved) directly back to the wetland or lagoon. Once the action monitoring point limit is achieved or the last 25 percent of the water in the cofferdam is reached, all discharge should be directed to the water treatment system.
- During dewatering activities all water discharged to the surrounding waterbody will be visually monitored constantly for turbidity.
- Over the course of any dewatering activity, if any impacts to fish or fish habitat is observed either inside the isolated area or outside at discharge point, work will be halted until the issue can be addressed.

DRAFT

- Efforts to reduce the turbidity of water pumped from work areas will be implemented, prior to final discharge, through the use of settling tanks, filtration through vegetation, erosion control devices such as sediment collection ponds, check dams or other devices, as per Section 7.3.10.2
- The area of sediment collection ponds and any other devices will be sized accordingly to accommodate the anticipated volume of discharged water.
- Discharged water will be encouraged to follow natural surface drainage patterns.
- Proper precautionary measures will be employed to prevent the alteration, disruption, or destruction of fish habitat.

5.6 Working Around Water – Fish and Aquatic Habitat

A significant adverse effect from the Project on fish and fish habitat is defined as "any undertaking or activity that is part of a designated project and that the Minister considers likely to result in the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat", as defined by the Government of Canada (1985, Section 35[1]). Fish habitat defined as "water frequented by fish and any other fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas."

5.6.1 General Environmental Mitigation Measures

General environmental mitigation measures that will be implemented to address potential adverse effects to fish and aquatic habitat include the following:

- All works in-water or below the high water mark either in the estuary or downstream of the dam will adhere to the fisheries timing window for approved in-water works.
- Surface water alteration applications (wetlands and watercourses) will be submitted during Project planning and design to request an authorization to alter fish habitat. Loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish habitat.
- Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it also pertains to the Contractor.
- Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbicides shall be used near possible fish habitat
- ESC planning will be completed to ensure Site run-off is not directed towards fish habitat.
- Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to DFO, based on the Fisheries Act current at time of the Project remedial phase, and decommissioning phase.
- To protect the marine environment from accidental spills, ensure that the SMP is in effect and its procedures fully communicated to staff.
- The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges.

DRAFT

5.6.2 Working Around Water

The need for additional mitigation measure may arise as the construction progresses. The Contractor(s) EM and/or CMOC EM will be On-Site during major works to provide advice and adaptive management of any additional identified issues.

To minimize impacts to surrounding environment the following mitigation measures will be followed for all activities in or within 30 m of the shoreline or wetland:

- Work should only commence following the installation of appropriate erosion and sediment control (ESC) measures as shown on the construction drawings. This includes the use of dual silt curtains in areas to be dredged. These measures should be inspected by the Contractor(s) EM and/or CMOC EM and determined to be functional.
- Silt curtains will be installed in such a manner to flush out fish from the intended work area prior to anchoring. This will be completed by installing the silt curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired location.
- As required, qualified biologists will be present for silt curtain installation and removal activities to ensure appropriate protocols are followed and prevent harm to fish.
- Silt curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging, or other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until silt curtains are deemed functional.
- Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in good repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate each piece of equipment to confirm all risk of spills or sediment release due to its use is mitigated prior to putting it in to service.
- All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. No items should be stored within 30 m of the shoreline, without approval from NSLI (via the Contractor(s) EM and/or CMOC EM).
- All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of month day to month day.
- If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed.
- The SMP shall be in effect and its procedures will be fully communicated to staff prior to work commencing.

5.6.3 Fish Removal

All required fish rescues/salvages must be completed under the direction of a qualified professional hired by the Contractor(s) who will be present during the fish removal activities. Fish rescues/salvages may be facilitated by partially dewatering the area to concentrate fish in pools so

DRAFT

long as they provide sufficient area for fish survival. The depth of partial dewatering will be established between the qualified professional and the Contractor(s) prior to work occurring. The following requirements apply to all fish rescues/salvages:

- NSLI will obtain all applicable fish permits (i.e., disposal) and approvals from DFO prior to commencing any fish relocation efforts.
- Where pumping is required from water known to contain fish, exclusion screens will be implemented by the Contractor(s) on all intakes to prevent incidental harm to fish. Exclusion screens will follow DFO requirements and also function to prevent the movement of plant material and other debris.
- Fish rescues will be completed by certified professionals and will be overseen by the Contractor(s) EM and/or CMOC EM.
- Fish removals effort must demonstrate a declining catch on subsequent efforts to demonstrate effectiveness of the fish removal methodology.
- Where applicable, fish will be relocated quickly and humanely into the adjacent waterbody in an area that is determined by the qualified professional to provide the highest chance of survival. (i.e., upstream or downstream).
- Any fish determine to be contaminated as per of the DFO Fisheries Act Authorization or invasive species captured will be humanely euthanized and disposed of following any described methodology as part of the fish relocation permits and/or Authorization issued by the Government of Nova Scotia or DFO. This includes following any additional reporting requirements.
- A PLFN protocol will be developed and required for any kill. This protocol will be utilized as part of the details outlined in the Contractor(s) SSEPP.

5.7 Product Handling and Storage

All necessary precautions to prevent and minimize the spillage, misplacement or loss of fuels and other hazardous materials shall be taken. All Acts and Regulations pertaining to special substances shall be followed. The delivery, storage, use and disposal of these hazardous materials will be handled only by trained personnel in accordance with government laws and regulations.

5.7.1 General Environmental Mitigation Measures

To minimize impacts to surrounding environment the following mitigation measures will be followed for product handling and storage:

- Equipment used will be mechanically sound with no oil or gas leaks. The Contractor(s) shall undertake frequent inspection of equipment and repair leaks immediately.
- Fuelling, storage and servicing of vehicles and construction equipment is not allowed within 30 m of a watercourse, drainage ditch, areas with a high water table, or exposed and shallow bedrock, unless otherwise approved and mitigation measure are included in the SSEPP and/or in accordance with an approved plan under a permit.

DRAFT

- Spill clean-up materials shall be accessible and maintained in the areas of fuel and chemical storage. Any spilled fuel or lubricants shall be promptly cleaned up and disposed of in accordance with the Contractor(s) EM instructions.
- No equipment shall be washed within 30 m of a watercourse or wetland unless completed within secondary containment and approved through SSEPP.
- Storage of petroleum products and storage of all products within secondary containment are not allowed within boundaries for water supply watersheds or designated environmentally sensitive areas. Lubricants, hydraulic fluid, grease, gasoline, diesel or other fuels will not be stored within 30 m of any watercourse.
- All tanks shall be protected from collision damage by the use of snow fencing to alert operators, or by the placement of barriers to impede equipment movement near the tank.
- Handling and fuelling practices shall ensure that contamination of groundwater will not occur.
- Fuel storage areas and transfer lines shall be clearly marked or barricaded to prevent damage from vehicles.
- If drums are stored on their sides, the drums shall be stored so that the bungs are in the "9 and 3" position, on level ground and prevented from rolling.
- Drum storage areas shall be marked or fenced with temporary fence to avoid vehicular impact.
- Day-use quantities can be stored upright or on the side as required. Drip pans lined with absorbent pads shall be used beneath tap.
- All stained soil resulting from the use of chemicals or fuels shall be cleaned-up and disposed of prior to leaving the work area.
- Waste oils and lubricants will be retained in a closed container and disposed of in an environmentally acceptable manner.

5.8 Spill Prevention

Spill prevention and response plan for both land and marine includes procedures, instructions, contact information, and reports are to be used to prevent spills and clean up in the event of an unforeseen spill of a regulated substance. The Contractor(s) will be responsible for preparing a Spills Management Plan (SMP) under a SSEPP for spills, fires and other environmental incidents. The SMP will have a list of emergency phone numbers. For quick reference, the list of emergency phone numbers can be found in Appendix F-2 (TO BE PROVIDED BY CONTRACTOR(S)).

The Contractor(s) and all Subcontractors must adhere to the mitigation measures outlined below.

5.8.1 General Environmental Mitigation Measures

To minimize impacts to surrounding environment the following mitigation measures will be followed for spill prevention:

- The Contractor(s) must ensure that all areas and equipment with the potential to cause a leak or spill will have adequate protection and are stored in designated areas per the Construction Drawings (Appendix E). This protection will include but is not limited to: spill containment

DRAFT

systems for oils, fuels and chemical storage and transfer areas; spill containment systems under stationary equipment such as generators, pumps and compressors; and containment and isolation from concrete works.

- Spill containment systems and drip trays will be impermeable and selected to allow full containment of spills and be capable to handle the volumes expected from an accidental release. This includes being able to contain 125 percent of the liquid storage capacity of the equipment it is housing.
- All heavy equipment, machinery, and tools required for the work shall be regularly inspected and maintained to avoid leakage of fuels and liquids.
- Materials within containment systems will be considered to be contaminated at the completion of the Project and will be disposed of accordingly.
- Vehicle and equipment refueling, storage, and maintenance should occur outside of the Site (Off-Site) or within designated areas as submitted and approved by the CMOC EM.
- The Contractor(s) will ensure that all staff will be trained on recognizing and proper action to follow in the event of a spill. This will include spill source recognition, spill prevention techniques, and proper spill reporting protocol. The spill response procedure will be posted and made available in the Site office trailer.
- The Contractor(s) will ensure that spill response kits for land and water are kept and maintained on Site. One spill kit must be in close proximity to each working equipment that contains deleterious liquid such as hydraulic fluid or fuel. All staff will be informed on the location of spill kits and kits will be replenished in the event that the contents contained within are used. The spill kits shall be appropriate in content for the material that could be spilled-.

5.9 Waste Management

5.9.1 Hazardous Waster Disposal Plan

Hazardous waste generated on Site will be managed and disposed of in a manner that prevents the material from entering or negatively impacting the natural environment both on and off-Site, as per the Nova Scotia Environment Act.

It is the responsibility of the Contractor(s) to implement and enforce storage and housing procedures, containment procedures, and best management practices to ensure that project work is carried out in compliance with all applicable provincial and municipal regulations.

5.9.2 General Environmental Mitigation Measures

In addition to the responsibilities outlined in Section 6 for general waste disposal, the Contractor(s) will ensure that all applicable staff and subcontractors will adhere to the mitigation measures described below for hazardous waste.

5.9.2.1 Storage and Handling

To minimize impacts to surrounding environment the following mitigation measures will be followed for product handling and storage:

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- Deliver, store, and handle materials in accordance with the manufacturer's written instructions and in accordance with the specifications, if specified.
- When not in use, all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) will be securely locked-up in the office yard to avoid vandalism and accidental spills. Materials will be stored in a dry location that is clean, dry, and well-ventilated. Furthermore, hazardous materials will be stored on impermeable pads a minimum of 30 m from water or wetlands and handled in a manner which prevents release into the environment.
- No hazardous material or equipment containing hazardous material will be stored overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps due to the increased risk of flood.
- All chemicals and compounds used for this Project will be utilized according to the appropriate Safety Data Sheet (SDS), stating guidelines and methods for proper use, and provided by the manufacturer of the product. Information on all project related regulated or hazardous materials (including all SDS) will be located in the Site office trailer. If any new regulated or hazardous substances are introduced during the Project time line, they will be added to the SDS binder.
- Only cleaning solutions and procedures that are not harmful to health, are not injurious to plants, and do not endanger wildlife, will be used adjacent to waterbodies, including wetlands. Any new, or potentially questionable, cleaning products shall be approved by NSLI (via the CMOC EM).
- Each hazardous material/waste will be stored in separate containers compatible with that material or waste substance.
- As required, all deleterious substances (including fuel, cleaners, solvents, paint, etc.) will be transferred at designated areas, such as refueling areas, as submitted to and approved by CMOC. The following equipment will be refueled where it is set to run; light towers and generators. Each piece will be established in a dedicated containment tray to prevent contamination of the Site in the event of a leak or spill during refueling. Refueling will occur with a containment tray in place, and a portable spill kit will be on hand.
- Unless approved otherwise by NSLI (the CMOC EM), only small equipment or hand tools (e.g., chainsaw) may be refueled outside of the designated refueling area when returning there is impractical. In those cases, all refueling will be completed over an appropriately sized containment tray with a portable spill kit on hand.
- Materials will not be disposed into sewer system, into waterbodies, onto the ground, or in any other location where they will pose a health or environmental hazard. Public waterways, storm and sanitary sewers will remain free of waste and volatile materials.
- Defective or damaged materials will be replaced as needed.
- The work area will be left clean at the end of each working day.

5.9.2.2 Designated Substances and Hazardous Waste Management

To minimize impacts to surrounding environment the following mitigation measures will be followed to address designated substance and hazardous waste management:

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- Hazardous materials will be appropriately disposed of at a licensed facility that accepts such waste in accordance with Dangerous Goods Management Regulations under Section 84 of the Environmental Act (N.S. Reg. 57/2016).
- All waste leaving the Site will be documented appropriately, properly transported under regulatory requirements as applicable, and documented appropriately including: date, time, type of waste, and weight.

5.9.2.3 Machinery and Equipment

To minimize impacts to surrounding environment the following mitigation measures will be followed for machinery and equipment operations:

- All machinery and equipment will arrive On-Site in a clean condition and be maintained free of fluid leaks, invasive species, and soil that may contain noxious weeds. Inspecting and cleaning machinery and equipment will be completed following best management practices.
- Unless approved otherwise by NSLI (via the CMOC EM), equipment refueling will be done at designated fueling areas at least 30 m from the water, on impermeable pads or spill trays. Used pads will be treated and disposed of accordingly. The operator is to be present during refueling with a spill containment kit available in the area.
- Vegetable based hydraulic fluids will be used in all machinery and equipment that is used in, on, or directly adjacent to water or wetlands and only the working end of the equipment may enter the water. The same will apply to equipment used near water or a wetlands unless mitigation measures approved by the Contractor(s) EM and/or the CMOC EM are applied.
- Any fuel storage tanks shall be double walled and have leak identification system of the primary tank.

5.9.3 Non-Hazardous Waste Disposal Plan

The following guidelines will be applicable for the proper handling, storage, transport, and disposal of non-hazardous waste generated on Site.

The Contractor(s) will be responsible for all waste generated over the course of the Project and see that it is tested, handled, stored, and disposed of in compliance with N.S. Reg. 26/2019: Solid Waste-Resource Management Regulation (as amended), and applicable municipal by-laws.

Mitigation measure described below will optimize the opportunity for waste reduction, re-use, and recycling to ensure the amount of waste produced is minimized and managed in an environmentally responsible manner. This will include the Contractor(s) utilizing licensed recycling and waste carriers and disposal facilities, in accordance with all Federal, Provincial, and Municipal legislation. The Contractor(s) will also maintain records of all waste generated on Site. At a minimum, where general non-hazardous waste and recycling is transported Off-Site for disposal the following will be recorded:

- The full name, address, and telephone number of the waste destination.
- The nature and approximate quantity of waste transported.
- The transport schedule, including start/end date and time.

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- The full name and address (if different than that of the Contractor(s)) of the transportation firm.
- Documented confirmation that any and all required sampling and laboratory analyses of the spoil have been completed.
- Documented confirmation that all required transport documents and requirements have been addressed.

The Site is located in an area which has the potential to be utilized by bears. Therefore, the Contractor(s) will employ the following mitigation methods to avoid attracting unwanted animals which can contribute to health and safety risks.

- Ensure that all waste generated is contained and stored in animal/bear proof containers that are appropriately labelled and in good working order. Garbage bins will be placed in predetermined locations and garbage bags will be collected at the end of each day. The combined daily garbage will then be placed in a bin that is secured and designated for pickup.
- Waste will be transported Off-Site regularly and before quantity exceeds the limits of the storage bins.

5.10 Excavation and/or Dredging of Contaminated Material

Removal of sediment is required is a primary component for the remediation work in the aquatic environment.

5.10.1 Environmental Mitigation Measures

To minimize impacts to surrounding environment the following mitigation measures will be followed for excavation and/or dredging of contaminated material:

- Dredging, particularly in the estuary, will be conducted during approved timeframes determined by regulatory bodies including DFO, and as indicated on the NSLI Approval to Proceed.
- Dredging of the overburden will be undertaken by a trained operator and will be conducted in a manner that minimizes the re-suspension of sediments in the water column.
- Should cutter suction dredging be employed for marine sediment excavation, the following procedures will be implemented:
    - The dredged material will be pumped from the dredge location through a flexible, closed pipe to the effluent dewatering area at the containment cell.
    - The cutter head will only operate below 1 m off the bottom, where water depth permits, to minimize fish entrapment (i.e., the cutter head will not be activated through the entire depth of the water column).
    - The speed of the cutter head will be maintained so that the least amount of sediment re-suspension will occur, while still being able to effectively dredge the area.
    - The pipe will be inspected routinely for any potential breaches in the sediment trap.

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- Should any leakage occur along the pipeline alignment, all dredging will cease until the breach is repaired.

- An environmental effects monitoring program is required by NSLI to monitor water quality (Total Suspended Solids [TSS]) during marine construction activity to assess the extent of any plume originating from the dredging. The Contractor(s) will develop a SSEPP that will avoid any exceedance of TSS well in advance to prevent an event.
  - Compliance point for NSLI is at point D, should include sampling analysis requirements.
  - Contractor(s) performing dredging operations are responsible for local monitoring and reporting of TSS in the immediate vicinity of the work area to confirm compliance with the contract documents and to provide early indication of any requirements to modify operations or mitigative measures to remain compliant.

5.11 Traffic Control & Equipment Movement

During Site preparation, construction and operation, road usage will increase which has the potential to cause delays in traffic flow and disturb nearby resident. Vehicle and equipment operation also has the potential to disturb terrestrial wildlife and their habitat, soil, groundwater quality and human health and safety. In addition, large vehicles may create additional noise and vibrational disturbances. Mitigation measures are described below.

5.11.1 Environmental Mitigation Measures

- Equipment and vehicles will only operate on cleared ROWs or areas designated for construction activities in the plans/drawings
- A speed limit of 30 km/h will be implemented to allow sufficient detection of wildlife for drivers, time for animals to avoid moving vehicles, and to limit the amount of dust and sediment disturbance.
- Sufficient signage will be installed along the access roads to alert all users to potential wildlife crossing and instruct that in the presence of wildlife, vehicles should stop to allow wildlife to cross.
- Drivers must stop and allow all incidental wildlife to cross the road passively without disturbance.
- All contractors, staff, and visitors are only permitted to park in a designated vehicle parking area and not along the Project access road.
- In the event that an animal is struck by a vehicle, the Contractor(s) EM must be informed, and proper authorities notified. Dead animals must be removed and disposed of in accordance with local municipal regulations in a timely manner as to not attract additional wildlife to the road.
- Any observations of large animals (e.g., bear, deer) must be reported to the Contractor(s) EM. The date, time, location and description of observation must be recorded and maintained.
- Any observation of reptiles or amphibians on road must be reported to the Contractor(s) EM
- Construction equipment will not enter within 30 m of watercourses/wetlands or identified environmentally sensitive areas unless it is an area under active remediation work or unless otherwise approved by the Contractor(s) EM and/or the CMOC EM.

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- ESC measures, implemented under Section 5.7, will be monitored during construction activities within the ROW and any areas associated with project construction activities. Where damage to these erosion control measures is observed, they will be promptly repaired to prevent siltation of watercourses/wetlands or other environmentally sensitive areas.

5.12 Dust Control

Water trucks are used to apply water on construction projects for dust control. Dust control practices shall be applied throughout all work areas as required.

5.12.1 Environmental Mitigation Measures

- Locations where water (or dust suppressant approved by CMOC) is to be applied, the amount to be applied, and the times at which it shall be applied, shall be determined by the CMOC EM. Application of water is not to be conducted in situations where surface water could freeze and create a potential traffic hazard.
- At least one mobile water/dust suppressant approved by CMOC are application unit for applying water shall be available to the work Site. Water shall be applied by means of a pressure type distributor equipped with a spray system of nozzles that will ensure a uniform application of water. Minimal amounts of water required to control dust will be applied such that potential for surface runoff of sediment is minimized.
- If water is the suppressant the intake hose to the tank shall be equipped with a device to prevent fish from being pumped into the tank.
- Sources of clean water shall contain sufficient flow such that the withdrawal rate will not noticeably reduce the flow in the watercourse.
- Water trucks shall not be driven into or through a watercourse/wetland, unless otherwise approved by the regulatory authorities.
- Water trucks will not be driven down to the edge of the watercourse/wetland, unless the area is firm, so that ruts will not form. Any disturbed ground or ground cover is to be covered with mulch or other erosion control material.
- Pumps and other equipment must not be repaired or refueled within 30 m of a watercourse/wetland or other environmentally sensitive area unless the equipment is permanently barge-mounted in which case approved refuelling procedures must be utilized.
- Waste oil, or other petroleum products, is not to be used for dust control under any circumstances.
- Paving maybe employed to control dust and run off for the project. Should paving be employed the following mitigation measures will be implemented:
  - Asphaltic mixes will be transported to the work Site in leak-resistant vehicles.
  - When placing asphaltic mix, care shall be taken to avoid spillage of the mixture.
  - When placing prime coat and tack coat, care shall be taken to avoid over spraying.

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- The application of prime coat and tack coat shall not exceed beyond the limit of asphaltic concrete to be spread and compacted in a day, unless otherwise directed by the Contractor(s) or Responsible Person.
- All prime coat spray nozzles are to be in good condition and capable of positive cut-off.
- Personnel will make reasonable efforts to minimize the volume of waste materials. Surplus materials will be used at other locations where possible or property disposed of as directed by Contractor(s) EM. Waste material will not be disposed of within 30 m of a watercourse/wetland or any identified environmentally sensitive area.
- Release agents used in truck boxes will be lightly coated. If liquid release agent is used, the trucks will be drained after each application and before each loading. Draining of liquid release agent will be conducted in approved locations, so as not to release liquids into surrounding watercourse/wetlands, buffer zones, or identified environmentally sensitive areas.
- Asphalt emulsion pumps will be cleaned only at the maintenance depot. All used fuel will be collected in closed containers, recycled or disposed of, at an environmentally approved facility.
- Shovels, rakes and hand tools requiring cleaning at the Site will be cleaned in/over empty drums, in a manner that allows for the containment of fuels or cleaning products and to minimize their escape into the environment.
- Hazardous cleaning materials contained in empty drums shall be returned to the maintenance depot, and from there disposed of in a manner approved by the Contractor(s) EM and/or the CMOC EM.

5.13 Site Security and Restricting Public Access

To prevent disruption of work activities, injury, vandalism or theft of equipment, unauthorized persons must be prevented from entering the active portions of the Site for the duration of the construction activities. While the implementation of the specified Site access controls may impact transportation and traffic in areas surrounding Site access locations, responses to transportation impacts are not addressed herein; instead, the CMOC will assign a Contractor to prepare a -SSEPP Transportation Management Plan.

The CMOC will be responsible for the overall site security and control plan of the Site including gate locks, signage, and regular security patrols. Notwithstanding, it is not feasible to secure the entire site so Contractor(s) will be responsible for area access and security controls for their work areas.

5.13.1 Environmental Mitigation Measures

- Advance notice to the public through advertisements and bulletins informing them of construction schedule and location associated with each project component, as described in the EMP.

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- Proper barricades and signage, including pylons, caution tape and "No Trespassing" or "Restricted Access" signs, will be placed at all access points and along permanent and temporary fence lines to prevent public access during construction.
- Site access roads will be constructed and maintained to be passable and safe under normal operating conditions and in any inclement weather conditions that allow continued remediation activities.
- Roads will be maintained to allow access to monitoring devices for facility inspections and emergency response, if required.
- Conditions of access roads will be inspected every four hours and documented in the monitoring report by the Contractor(s) EM.
- The Site entrances and access controls shall remain in place for the duration of the Project.
- Manned supervision will be the primary control mechanism against uncontrolled access. The CMOC will provide this control by preventing entry to and removing unauthorized personnel. Barriers and signage as noted above will be used where/when personnel are not able to provide access control.
- All personnel shall notify the CMOC if an unauthorized person either enters or is present on the Site.
- Should an unauthorized person enter a delineated work area, site personnel shall report the entry immediately to the appropriate personnel, including CMOC.
- All workers must follow the Site-Specific HASP. Prior to accessing the Site, all workers and visitors must have completed the Training Program as outlined in the EMP and SSEPPs.
- Any person wishing to gain access to the Site is required to have approval from the NSLI/ CMOC. A "Site Access Application Form" provided in the PEPP will be filled out for each person requiring access to the site.
- Any visitors to the Site will also be logged and will be familiar with and acknowledge the Site-specific HASP.
- Site access contingency plans are provided in the PEPPs and the EMP.

5.14 Decontamination of Equipment

During the course of construction activities, equipment, machinery and Site personnel will come into contact with contaminated sediments and other materials. As such, all equipment and personnel must be properly decontaminated prior to leaving the Project Site or entering clean areas.

Decontamination will be required for all equipment (including heavy equipment) and vehicles that:

- Have come into contact with contaminated materials and leave the Site.
- Have come into contact with contaminated materials and are moving to an uncontaminated work area on the Site.
- Are transitioning between the areas for handling of fill/sediments.

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At a minimum, the following precautions should be taken in the field during for site personnel during decontamination operations:

- Use laboratory detergent, safety glasses with splash shields or goggles, and latex gloves will be worn.
- No eating, smoking, drinking, chewing, or any hand to mouth contact should be permitted during cleaning operations.

5.14.1 Environmental Mitigation Measures

Decontamination procedures include:

- Visual inspection of equipment (including tracks, tires and truck beds).
- Physical removal of solids prior to washing.
- Removal of residual impacts with high-pressure water (and steam if necessary).
- Inspection of all equipment by On-Site personnel prior to departure from the Site.
- Inspection of clean On-Site roadways leaving the decontamination area by the Contractor's EM, who will document observations in the Environmental Inspection Log.

6. Valued Components Mitigative Measures

This section documents the mitigation measures as it relates to each Project Component and identified VC. For each Project component, its potential interaction with a VC and aspect of the physical environment, potential effects, and mitigation measures were determined.

The VC components includes:

- Air Quality and Odour
- Greenhouse Gases
- Noise
- Light
- Geology, Geochemistry, and Soil
- Groundwater
- Surface Water
- Terrestrial Habitat and Vegetation
- Wetlands
- Mammals and Wildlife
- Marine Environment
- Fish and Aquatic Habitat
- Migratory Birds

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- SAR
- Mi'kmaq of Nova Scotia
- Economic and Social
- Archaeological/Cultural Heritage Resources
- Human Health

The effects assessment was completed for each Project component:

- Waste Management
- Dredging
- Wetland Management
- Bridge at Highway 348
- Infrastructure Decommissioning (pipeline, treatment buildings, dam, and berms)

The proposed mitigation measures are described in Appendix C (Tables C-1 to C-7) of this report.

7. Environmental Effects Monitoring Plans

7.1 Follow-up Programs

Follow-up programs will verify the accuracy of the effects assessment and determine the effectiveness of the measures implemented to mitigate the adverse effects of the Project. Follow-up programs are an integral part of the broader EMP and PEPP that will be implemented post-approval for the purposes of verifying environmental effects predictions and the effectiveness of mitigation. Follow-up programs also provide NSLI with a means of ensuring compliance with applicable laws and regulations targets, and objectives for continuous improvement.

Compliance Monitoring programs for the construction phase will be established in consultation with regulatory agencies and as part of the permitting process through the Conditions of Approval. Notwithstanding this, proposed monitoring plans are discussed below that describes the objectives and substance of monitoring, as they are currently understood.

All monitoring reports will be posted on the Boat Harbour Remediation Project website and provided to PLFN in hard copy, as well as further distribution as required through the Conditions of Approval(s)

7.2 Environmental Effects Monitoring

The purpose of an EEM is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. EEM provides NSLI with the means for identifying undesirable change to the environment and a basis for adaptive management (if and as required).

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Table 7.1 summarizes the preliminary monitoring programs presently proposed for the Project that were developed based on a conceptual level of design (including the management of leachate from the CC and groundwater monitoring). The preliminary monitoring programs will be finalized based on discussions with regulators, public stakeholders, and PLFN, as appropriate. The finalized monitoring programs will include specific measures to ensure that post-remediation contaminant levels meet standards so that the area can return to a naturalized state.

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Table 7.1 Summary of the Preliminary -Monitoring Program Proposed for the Boat Harbour Remediation Project

Monitoring Plan	Minimum Requirements	Minimum Monitoring Requirements	Monitoring Accuracy	Equipment and Calibration
Air Quality and Odour	No effects or disruption to residents' businesses, community facilities or recreational and tourist activities	Real-time monitoring: Total Suspended Particulate (TSP) PM_{10} H_2S Total Volatile Organic Compound (TVOCs) - downwind and upwind of remedial activity at fence line Air quality monitoring (including dust) - Visual	+/- 5% of the total flow rate	High volume of particulate sampler, NIST – traceable calibration orifice and manometer. Downwind of construction activities frequency of two 15 minute readings per hour. Upwind of construction activities frequency of 15, 1, 15 minute ready per hour.
Groundwater		Quarterly sample collection and analysis. Quarterly monitoring well level measurement. Annual reporting. Groundwater quality and groundwater elevation *General inorganic chemistry *Metals (including mercury) *Flouride Containment Cell Leachate (from existing MH system) *General inorganic chemistry *Metals (including mercury) *Flouride *TKN *BOD *COD *TSS *TP *Phenols		
Surface water	Identified minimum parameters Compliance: General Chemistry, Metals, PAHs, Petroleum Hydrocarbons, Dioxins	Compliance Sampling: Weekly collection by CMOC of 24 hour composite sampling at Point D Operation Sampling: Daily sampling of dewatering effluent by Contractor(s) with collection	0-2.5 Nephelometric Turbidity Units (NTUs) ± 0.05 NTU 2.5-100 ±2% >100 ±3% pH +/- 0.2	Field turbidity is to be monitored using an optical backscatter (OBS) nephelometer with an underwater sensor and direct surface readout or another instrument having similar capabilities (i.e., U52 Horiba Flow Through Cell.).

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Table 7.1 Summary of the Preliminary -Monitoring Program Proposed for the Boat Harbour Remediation Project

Monitoring Plan	Minimum Requirements	Minimum Monitoring Requirements	Monitoring Accuracy	Equipment and Calibration
	and Furans, and Toxicity. Effects/Operations: Total Aluminum, TSS	of 24 hour, time-based composite samples of dewatering effluent that will be returned to the active dredging area.		Daily field calibration and quarterly maintenance calibrations. -
Terrestrial Habitat Vegetation	Minimize impacts to existing native vegetation	Visual		Vegetation monitoring plan will be conducted over a minimum of 3 years, at least twice per year in late May-early June and again in Late August.
Wetlands	Minimize impacts to existing wetlands	Visual		
Mammals and Wildlife	Minimize disturbance to wildlife	Visual		
Marine Environment	Minimize disturbance to marine animals and habitat	Visual		Inspection of ESC measures.
Fish and Aquatic Habitat	Minimize impacts to existing aquatic resources	Visual		Inspection of ESC measures. Annual fish community survey downstream of dam and watercourses upstream of harbour.
Migratory Birds	Minimize impacts to migratory birds	Visual		Nest survey conducted during breeding bird season within 7 days of any project activity occurring. Monitor nests near equipment or material stockpiles and exposed areas. Daily routine inspections.

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Table 7.1 Summary of the Preliminary -Monitoring Program Proposed for the Boat Harbour Remediation Project

Monitoring Plan	Minimum Requirements	Minimum Monitoring Requirements	Monitoring Accuracy	Equipment and Calibration
Species at Risk	Minimize impacts of SAR	Visual		
Mi'kmaq of Nova Scotia				Routine noise, light and air monitoring.
Economic and Social		Visual		Monitor roads and highways and liaise with NSTIR as needed to facilitate repairs. Air monitoring.
Archaeological/ Cultural Heritage Resources		Visual		
Human Health		Visual		Air monitoring.

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7.3 Monitoring Responsibility

Construction monitoring will be the responsibility of the Contractor(s) for each valued component as described in the SSEPPs. Compliance, and follow-up monitoring will be implemented by the CMOC EM as described in this PEPP and Long-term monitoring will be conducted during post construction by the Proponent or their designee. Background monitoring was completed for the EEM Programs by the Proponent or their designee.

The compliance monitoring will be CMOC responsibility and as such may hire a sub-consultant to perform this activity.

7.3.1 Reporting Protocols

As outlined in the EMP, prepared under separate cover, the remediation activities will be monitored and results will be reported. The details of communication methods and frequency that the NSLI will use to most effectively report results to the regulators, managing partners, and individuals who are invested, involved or interested in the Project or are members of the general public are outlined in the EMP.

7.3.2 Reporting Methods

Numerous mechanisms and support materials will be used to communicate monitoring results to the public. These communication methods will include, but may not be excluded to, the following:

Internet Web Site

Monitoring results will be posted on the NSLI Web Site, which will continue to expand as new reports become available. The NSLI Web Site will be reformatted so that it is made accessible to people with disabilities. In addition, interested parties will be able to sign up for updates on Project aspects that interest them, which will then be forwarded electronically as they become available.

Newsletter

The Proponent quarterly newsletter will be available to every household and business in Pictou. The purpose of these newsletters is to report quarterly monitoring results, provide some information on Project activities and emergency protocols and to follow-up on issues and concerns raised by the public.

Community Facilities

Hard copies of monitoring reports will be available annually at designated locations (i.e., the Proponent office) for public review.

Project Facilities

Monitoring results will be available at the Proponent office for any interested member of the public.

Media

Summarized results and emergency notifications will be issued using print and radio media to instill immediate public awareness and encourage public response. News from the BH Remediation

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Project will be communicated in a way that is dependent on the purpose of the message; for instance, an immediate press release will be issued in local, regional and national media channels, as appropriate, in the event of an emergency.

Response Line

An automated telephone response line will be established to allow communication of views and opinions from the public to the Proponent. Public comments will be considered, and responses sent when applicable.

Meetings

Members of the NSLI will be available to meet with local groups upon request to explain monitoring results and reports and respond to any concerns. In addition to providing immediate guidance on questions posed at these meetings, all comments will be recorded, considered and responded to in writing, where appropriate.

7.4 Monitoring Programs Overview

The purpose of the monitoring program is "to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety". Monitoring programs provide NSLI with the means for identifying undesirable change and a basis for adaptive management (if and as required).

The preliminary monitoring programs will be finalized based on discussions with regulators, and scientific advisors. The finalized monitoring programs will include specific measures to ensure that post-remediation contaminant levels meet standards so that the area can meet the design objectives and return to a naturalized state.

During construction, Contractor(s) shall monitor their construction activities for environmental impacts to determine whether the impact-minimizing measures developed for the activity are effective. The main purpose of Construction/Mitigation Monitoring is to identify the source of air and/or water contaminants before any contaminants impact the receiving environment.

This PEPP and -SSEPP(s) contain specific mitigation measures to minimize impacts by identifying potential impacts related to each valued project activity and providing general and activity specific proactive procedures.

7.4.1 Monitoring Duration and Frequency

Environmental monitoring at the Site falls into four broad categories:

1. Daily and weekly inspections
2. Monitoring of Site for ecological impacts
3. Environmental monitoring of identified parameters
4. Adaptive management to achieve environmental objectives

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7.4.2 Daily and Weekly Inspections

The Contractor(s) will conduct defined and scheduled inspections, testing and maintenance of environmental structures, facilities, equipment, controls and systems to ensure they are functioning efficiently and as designed in order to ensure compliance with the PEPP and for incident prevention.

The Contractor(s) EM will be responsible for monitoring and inspection for:

- Daily inspection of Erosion and Sediment Control Measures with weekly written reports by the Contractor(s) EM to the CMOC.
- Daily visual inspection of riparian, wetlands, and terrestrial environments with weekly written reports by the Contractor(s) EM to the CMOC.
- Daily monitoring for migratory birds measures, nesting with weekly written reports by the Contractor(s) EM to the CMOC.
- Daily monitoring for compliance with mitigation measures related to air quality, odour, noise, and light with weekly written reports by the Contractor(s) EM to the CMOC.
- Daily confirmation in writing with archaeological resources verifying Contractor(s) compliance with permit requirements and procedures with weekly written reports by the Contractor(s) EM to the CMOC.
- Daily sampling and analysis of dewatering effluent discharge during dredging operations including analysis for specific constituents known to be indicators of performance (Total Aluminum, pH at minimum), including weekly written reports by the Contractor(s) EM to the CMOC
- Daily sampling and analysis of temporary leachate treatment system effluent for duration of operation, including analysis for specific constituents known to be indicators of performance, including weekly written reports by the Contractor(s) EM to the CMOC.
- General inspection of the work area to ensure all materials are properly stored, protected and managed.
- Visual survey and documentation of all required ESC controls to ensure they are fully functional and maintained as outlined in Section 5.1 of this report.
- Inspection of the work area to identify and document any spills, excessive dust, excessive noise, or other issues under this PEPP that need to be addressed.
- Inspection of all other project components as a result of the Contractor's construction methodology.
- Inclusion of inspection documentation in the Contractor(s) daily report.
- The Contractor(s) shall customize an inspection form/report based on their specific construction methodology and submit for approval to the CMOC EM through the submittal process.
- Conduct ecological monitoring as detailed in herein.

The Contractor(s) shall be responsible for weekly summary reports, as well as the specific weekly inspection, sampling, reporting, and analysis as outlined:

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- Weekly sampling and analysis of temporary leachate treatment system effluent for full analysis of general chemistry, metals, PAHs, Dioxins and Furans, hydrocarbons, including weekly written reports by the Contractor(s) EM to the CMOC.

Detailed/weekly inspections will be completed by the CMOC during regular operations and will be completed by the CMOC EM. These inspections will include a more detailed assessment of Site conditions and identify potential environmental risks. In addition to the items inspected daily by the Contractor(s), weekly inspections by CMOC will:

- Examine areas where work is slated to begin/change/end to identify additional measures that should be implemented.
- Complete a more detailed assessment of ESC measures and compile recommendations for improving efficacy, if needed; confirm previous recommendations have been suitably addressed.
- Measure turbidity and pH upstream of the harbor within the waterbodies/watercourses discharging on either side of the work area to monitor and review any changes or emerging trends that could require a change to this PEPP or SSEPP(s).
- Continual measurements for TSP, PM10, H2S, and TVOCs will be taken downwind and upwind of remedial activity at fence line perimeters to monitor and review any changes or emerging trends that could require a change to this PEPP or SSEPP(s).
- Recognize any potential risks that are not addressed in this PEPP and provide recommendations for updating the document including photos showing any issues identified in reports.

It is also the role of the CMOC EM to provide further monthly, quarterly, and as-needed inspection, sampling, and analysis as follows for purpose of Compliance Monitoring:

- Quarterly sampling of groundwater quality and quantity (and containment cell annual reporting) including annual reports for submission to Regulatory Agencies.
- Monthly composite sampling and analysis of bulk water/surface water at discharge point (Point D) for comparison with Contractor(s) results.
- Monthly sampling and analysis of dewatering effluent, for comparison with Contractor(s) results.
- Monthly sampling and analysis of TLTS effluent (during TLTS operation) for comparison with Contractor(s) results.
- Confirmation sampling of sediment after dredging and calculation of the Surface Weighted Average Concentration for purpose of demonstrating compliance.

It is expected that noted inspection deficiencies are to be corrected immediately or identified at the daily construction planning meeting to be resourced and scheduled to be completed based on risk and in a timely manner. It is expected that modifications will be required to be made to the PEPP in consultation with the CA and NSL, as construction progresses and deficiencies identified. A sample of environmental monitoring forms and reports are attached in Appendix D-1.

DRAFT

7.4.3 Environmental Monitoring of Identified Parameters

Environmental sampling and monitoring of regulated discharge criteria shall be considered when the Contractor(s) develops its construction methodology. The Contractor(s) will be required to monitor and measure component plan regulated discharge. The Contractor(s) shall make allowance for sampling and measurement to confirm performance of controls are being achieved. Notwithstanding this, the following parameters shall be sampled and analysed as part of the day to day operations:

- Turbidity
- pH
- TSP
- PM_{10}
- H_2S
- TVOCs

The Contractor(s) shall have monitoring equipment available at all times capable of meeting the parameter range being measured with an accuracy level stated in Table 7.1. The Contractor(s) shall provide as a submittal the following information for each parameter:

- Parameter
- Sampling and analysis method
- Equipment make and model to be used (as applicable)
- Maintenance/calibration schedule (as applicable)

Should the component plan monitoring compliance come in to question during the execution of the Contractor's work, either as a result of any inquiry, assessment or other technical request from the CMOC or NSLI, the Contractor(s) shall make cost and schedule allowances for implementing corrective action or conducting potential additional monitoring, as per the Table 7.1, to confirm compliance.

Should additional monitoring be required based on the Contractor's construction methodology, the Contractor(s) shall provide the required submittals. Construction Monitoring Reporting will, with the exception of exceedances of trigger thresholds or action levels, be project component specific and will be submitted to the CMOC by the Contractor(s).

7.4.4 Exceedance of Thresholds

Where monitoring results indicate an exceedance of trigger thresholds or action levels, and/or visual parameters observed, these results will be communicated immediately (verbally and concise memo) to inform the CMOC and the NSLI. Mitigative measures will be implemented immediately up to and including stopping the work to reduce the concentrations or measurements to acceptable levels.

DRAFT

7.4.5 Non-Compliance

The NSLI or the Departmental Representative (CMOC) may stop work (i.e., of a specific activity where circumstances warrant) until satisfactory corrective action has been taken. Circumstances where a stop work order may be warranted include where there is:

- An imminent or clear contravention of legislative or regulatory requirements with the potential for a significant adverse effect from project work or activity.
- An imminent or clear threat to human health and safety or contravention of a health and safety protocol.
- Imminent or clear damage to property.
- Where the previously requested corrective action has not been taken to the Departmental Representative's satisfaction.

It is expected that if the Contractor(s) implements this PEPP and SSEPP(s) plan, combined with detailed planning and execution involving Contractor(s) environmental resources, the Site should never reach a condition requiring a stop work order. However, stop work order issued as a result of Contractor(s) non-compliance shall be to the Contractor's account.

7.4.6 ESC Monitoring

Inspection and documentation of ESC measures at the Site will be completed as follows:

- Daily inspections of the ESC measures is to be conducted by the Contractor(s) EM and documented in as part of the Detailed ESC Inspection report and submitted to the CMOC EM indicating if ESC measures are adequate or describing any changes that were made. An inspection report template is provided in Appendix D-2.
- After any rainfall event of 25 mm or more in a 24-hour period, ESC measures are required to be monitored on a daily basis until precipitation stops and run off conditions return to baseline. The Contractor(s) EM will complete daily inspection reports during this period. An inspection report template is provided in Appendix D-2.
- Any deficiencies in control measures will be corrected immediately before work continues in the affected area.

7.5 Valued Component Monitoring

7.5.1 Air Quality and Odour

The Air Quality and Odour monitoring program will be carried out by an Independent Air Monitoring consultant with information provided to CMOC. The ambient air quality monitoring (including dust) will occur during the Site preparation and construction and operation phases of the Project. The frequency of the sampling periods during the Project and sampling locations will be confirmed based on the results of the IAAMP, which will be reviewed in detail prior to construction. The frequencies of this monitoring will follow National Air Pollution Surveillance (NAPS) and possible variations as outlined by subsequent approvals.

DRAFT

7.5.1.1 Real-time Monitoring

The real-time monitoring is critical to ensure the remediation work is carried out in a safe manner without the release of harmful levels of air emissions. The primary objective of real-time monitoring is to measure air quality, on a continual basis at Fixed Monitoring Stations (i.e., downwind fence line perimeters). Monitoring data are compared to approved, short term actions levels developed to assist the Contractor(s) in immediately modifying Site activities and preventing exceedances of health-based compliance criteria.

The real-time work will focus available resources on those contaminants that pose the most significant health risks during remedial activity as summarized above Table 7.2.

Monitoring Duration and Frequency

Continual measurements for TSP, PM_{10}, H_2S, and TVOCs will be taken downwind and upwind of remedial activity at fence line perimeters. Fixed monitors will be positioned on stable tripod along exposed downwind perimeters at the start of each workday. Each monitoring Site will measure and record 15-minute average concentrations on a continual basis throughout the workday. Supporting data management software package will be utilized to provide ongoing readout of concentrations over pre-set averaging periods.

Real-time monitoring will be carried out using handheld instruments downwind of construction activities at a frequency of two 15-minute readings per hour. The monitoring frequency for upwind of construction activities will be 15, 1, 15-minute reading per hour.

Table 7.2 Ambient Air Quality Standards for this Assessment

Indicator Compound	Averaging Period	Concentration	Source
		µg/m^3	
TSP	24-hour	120	NSAQS
	Annual	70	NSAQS
TVOC	24-hour		
PM_{10}	24-hour	50	Ontario - Interim
$PM_{2.5}$	24-hour	28	CAAQS (2020)
	Annual	10	CAAQS (2020)

Notes:
µg/m^3 – micrograms per metre cubed
Ontario Interim guideline for PM_{10} is no longer in effect, provided for informational purposes only
$PM_{2.5}$ 24-hour CAAQS for 2020 is based on the 3-year average of the 98th percentile of the daily 24-hour concentrations
$PM_{2.5}$ Annual CAAQS for 2020 is based on the 3-year average of the annual average concentrations

Monitoring Location and Equipment

All real-time measurements will be performed at predetermined locations, with exact locations selected prior to start of each work day based on a review of the prevailing wind direction(s), wind

DRAFT

speeds using the on-Site weather station that is used to collect meteorological data, type of work activity and location of activity (source) in relation to downwind receptors.

Hand-held instruments or another instrument having similar capabilities will be used to screen concentrations of TSP, PM_{10}, H_2S, and TVOCs. Instrumentation shall be capable of logging minimum, maximum and average concentrations over predetermined time intervals. Units will provide real-time clock for time and date sampling of events.

Action Levels

The Site action levels are based on an approach that considers the budgeting of emissions during the workday. The budgeting of emissions takes into account shifting wind patterns.

The purpose of the monitoring is to ensure emissions (TSP, PM_{10}, $PM_{2.5}$, and TVOCs) from the remediation works do not contribute to an exceedance of the maximum permissible ground level concentrations specified in the Schedule A of the Air Quality Regulations made under Section 25 and 112 of the *Environmental Act (2020)*. The following action measures will be implemented for the construction components if concentration measures are elevated as a result of project works:

a) In the case where real-time TSP, PM_{10}, H_2S, and TVOCs concentration measure near the allowable concentrations, the GC will be notified that the work activities should be closely monitored and procedure revised to incorporate mitigative measures. This step is implemented as an additional safeguard. The independent consultant will notify CMOC and will investigate potential source of air emissions. First line of defense measures such as addition of water sprays to control airborne dust or changing activity locations may be implemented.

b) In the event where real-time concentration measures of any of the indicator compounds meets the allowable daily maximum, the independent consultant will notify CMOC will evaluate work practices and determine the appropriate course of action. Temporary stop work practices will be evaluated. If any of the indicator compounds action level is exceeded as a result of Site work activities, Site work will be temporarily suspended until proper techniques are identified and implemented. The Contractor(s) is to initiate appropriate control measures. Work will resume within a short time period when corrective procedures are implemented.

The Contractor(s) is responsible for overseeing the implementation of any mitigation measures deemed necessary by CMOC and/or the proponent. The independent consultant and/or Contractor(s) are also responsible for information the CMOC of any intrusive activities that will be occurring within 24 hours.

7.5.2 Geology, Geochemistry, and Soil Monitoring

Erosion control measures and soil stabilization practices will be monitored and maintained until slopes have stabilized/areas have been re-vegetated. However, no specific on-going monitoring proposed geology, geochemistry, and soil is proposed based on the following rationale:

- Soils have been well characterized and the only changes are those which remove contaminants (improve soil quality) from impacted areas identified through the environmental baseline study and ESA programs. These programs have associated monitoring outlined in this EIS that will be completed during and post-remediation.

DRAFT

- Areas where soils will be removed outside of the impacted areas such as borrow pits will not have soils replaced and therefore no soil quality degradation is predicted.
- Areas where soils may be imported for activities such as road improvements, construction of temporary pads and berms will be of soils that are suitable for that intended use and will be subjected to soil quality testing and results compared to final land use criteria. Only soils of suitable quality will be used.
- Soils used in the construction of temporary berms to create the "coves" for the active remediation of Boat Harbour are to be re-used for construction and Geotube® stabilization in the CC area.
- Well-developed sediment and erosion control and construction management techniques will be used at the Site to minimize risk to soil quality degradation.
- Soil quality is linked to surface water quality and groundwater quality and both of these VC have robust programs proposed for the Project that serve to monitor possible geology, geochemistry, and soils impacts. For the reasons above no additional monitoring is needed for the geology, geochemistry, and soils.

7.5.3 Groundwater

Groundwater quality monitoring programs for the construction phase will be established in consultation with regulatory agencies and as part of the permitting process through the Conditions of Approval. Notwithstanding this, a proposed groundwater quality monitoring plan is discussed below that describes the objectives and substance of monitoring.

The current and future CC's hydrogeologic environmental performance is currently monitored through a comprehensive long-term groundwater monitoring program. This monitoring program includes collection of static water levels and groundwater quality samples taken throughout the year at an extensive network of monitoring wells. The monitoring well network has evolved through the many years of Site monitoring to provide a very detailed account of the distribution of hydraulic head (static groundwater conditions) and groundwater quality within the various flow zones.

Groundwater quality samples are collected for a comprehensive list of analytes to identify any operations-related alterations to groundwater quality. This monitoring program is currently in place and will be maintained through the operation of the CC. In addition, as part of CC closure, infrastructure for long-term monitoring and care of the CC will be constructed. This will include required groundwater and leachate monitoring wells, gas monitoring probes, surface water monitoring station, perimeter fencing, signage as needed and access road for long-term maintenance and inspection. Leachate collection system cleanout riser piping will be installed to allow for long-term inspection, maintenance, and cleaning of the leachate collection piping.

The long-term groundwater monitoring program tracks changes in groundwater quality and flow over time and will be used to assess the validity of the model predictions regarding the CC and liner systems performance. As with any environmental monitoring program, modifications to the program are occasionally necessary to adapt the program to evolving conditions. Accordingly, the monitoring program will be reviewed, as part of the annual reporting process to ensure that the monitoring program is adequately characterizing Site conditions with respect to the presence and movement of operation-related groundwater quality alterations.

DRAFT

The results of long-term monitoring will be reviewed and interpreted in detail annually as part of the annual reporting process. Annual data interpretation and reporting is used to ensure any deteriorations in environmental performance are identified and addressed through changes in operational practices or implementation of augmented remedial responses.

Groundwater monitoring analytics will include at a minimum the following constituents, in addition to groundwater elevation:

- General inorganic chemistry
- Metals (including mercury)
- Flouride
- TKN
- BOD
- COD
- TSS
- TP
- Phenols

Should groundwater impacts above applicable criteria for the Site be detected during monitoring the effects will be further evaluated by a re-sampling and if found to be indicative of an effect, mitigation measures will be employed in consultation with appropriate regulatory agencies as per this PEPP. Likely mitigation measures based on Site conditions will include source identification and removal, groundwater removal and treatment or containment by hydraulic or physical methods until impacts were within appropriate limits.

7.5.4 Surface Water

Surface water quality monitoring programs for the construction phase will be established in consultation with regulatory agencies and as part of the permitting process through the Conditions of Approval. Notwithstanding this, a proposed water quality monitoring plan is discussed below that describes the objectives and substance of monitoring.

7.5.4.1 Water Quality Monitoring

As water quality can change drastically based on the flow event (wet/dry) and season it is recommended that the CMOC will collect two samples, one during a wet event[2] and one during a dry event[3] are collected during Spring summer Fall.

To gain a clear understanding of the background water quality entering Boat Harbour it is recommended that monitoring involves collecting samples from each of the main streams entering Boat Harbour, plus one from the pond outfall near the CC.

[2] A wet event is defined as a sampling event following a rainfall event in excess of 5 mm

[3] A dry event is defined as a sampling event following a minimum of 3-4 days of no rain

The specific locations of monitoring points will be dependent on the active working area, and project phase. The location of surface water monitoring will be testing will be determined through the permitting and approvals process and indicated on figures included in the applicable SSEPPs.

Effluent Monitoring

The Contractor(s) will be required to complete daily monitoring of CC dewatering effluent with the collection of 24 hour, time based composite samples of dewatering effluent that will be released into the active dredging area. Samples will be submitted to a Canadian Association for Laboratory Accreditation (CALA) accredited lab for parameters in Table 7.3. Regulate operation of dredging and slurry conditioning systems such that the concentrations of all parameters listed in Table 7.3 do not exceed mass loadings listed in the table. Adjust dredging rate and chemical conditioning program as required to meet specified discharge parameters. The Contractor(s) will provide calculated mass loading data based on sample results (per above) and dredging rate over period of sampling. The Contractor(s) shall execute analytical testing (as described above) to facilitate mass loading concentrations. The Contractor(s) shall procure expedited analytical results (maximum 48 hours turnaround time) to facilitate mass loading calculations. Should results become consistent and well below the mass loading, a reduced sampling program may be implemented.

Table 7.3 Geotube® Effluent Mass Loading Limits

Parameter	Unit	Daily Limit
Cyanide	g/day	14.4
pH		6-9
Metals		
Total Mercury (Hg)	g/day	0.48
Methylmercury	g/day	0
Total Aluminum (Al)	g/day	24780
Total Arsenic (As)	g/day	0
Total Barium (Ba)	g/day	1392
Total Cadmium (Cd)	g/day	2.64
Total Chromium (Cr)	g/day	30
Total Copper (Cu)	g/day	132
Total Lead (Pb)	g/day	25.8
Total Nickel (Ni)	g/day	37.2
Total Silver (Ag)	g/day	1.68
Total Thallium (Ti)	g/day	0
Total Uranium (U)	g/day	2.04
Total Vanadium (V)	g/day	52.8
Total Zinc (Zn)	g/day	342
Hexavalent Chromium (Cr VI)	g/day	0
Petroleum Hydrocarbons		
Benzene	g/day	0
Toluene	g/day	0
Ethylbenzene	g/day	0
Total Xylenes	g/day	0

DRAFT

Table 7.3 Geotube® Effluent Mass Loading Limits

Parameter	Unit	Daily Limit
C_6-C_{10} (less BTEX)- GAS	g/day	0
>C_{10}-C_{16} Hydrocarbons- FUEL	g/day	882
>C_{16}-C_{21} Hydrocarbons- FUEL	g/day	1644
>C_{21}-<C_{32} Hydrocarbons- LUBE	g/day	4320
Modified TPH (Tier1) GAS/FUEL/LUBE	g/day	6846
Dioxins and Furans		
2,3,7,8-TCDD	g/day	0
Polyaromatic Hydrocarbons		
1-Methylnaphthalene	g/day	-
2-Methylnaphthalene	g/day	-
Acenaphthene	g/day	-
Acenaphthylene	g/day	-
Benzo(a)pyrene	g/day	-
Chrysene	g/day	-
Fluorene	g/day	-
Naphthalene	g/day	-
Pyrene	g/day	0.408
Quinoline	g/day	-
Rainbow Trout (Acute)	Pass/Fail	Pass

Specific monitoring procedures, protocols and reporting requirements are to be consistent with NSE requirements and standard operation procedures developed for the Groundwater and Surface Water Sampling Program. The Contractor(s) shall update the SSEPP and request updated to the EMP and PEPP with the details of the surface water monitoring protocol.

Estuary Monitoring

All dredging activity within the estuary will be monitored to ensure regulatory compliance. The sampling of dredging within Boat Harbour will inform the Contractor(s) and NSLI/CMOC the potential of non-compliance such that corrective action can take place in advance of an event occurring.

During dredging work in the estuary, surface water monitoring is to be completed by the CMOC EM at a point roughly mid-depth of the water column near the centre of the channel during flow events. Monitoring should commence with the further downstream location and progress upstream to avoid any disturbances to the sample. Field turbidity is to be monitored using an optical backscatter (OBS) nephelometer with an underwater sensor and direct surface readout or another instrument having similar capabilities. Prior to monitoring, all equipment and sampling devices are to be calibrated as per manufacturer's recommendations.

7.5.4.2 Turbidity Monitoring

The TSS will be monitored over in the estuary before beginning remediation work. Monitoring will include the enforcement of limits on specific contaminants of concerns (COCs) that may be associated with the suspended solids (i.e., metals, dioxins and furans).

DRAFT

The Contractor(s) shall prepare a SSEPP using BMPs to limit TSS and turbidity around areas of active dredging and/or on event-basis to monitor the efficacy of ESC measures. The details of the monitoring programs will be refined and developed in consultation and collaboration with regulatory agencies and other stakeholders.

These events will be defined as storms that are predicted to deliver more than 25 mm rain or equivalent in snowmelt to areas that have exposed soils (note that soils should be protected at non-active construction Sites). When preparing the SSEPP, the Contractor(s) shall accommodate for changing Site conditions, including water levels, surface ice, construction methodologies and general safety related to dredging and monitoring.

The purpose of this monitoring program is to identify areas that require additional protective measures. All data collected by the Contractor(s) EM submitted to the CMOC EM for further consideration and action (implementation of additional ESC measures). The CMOC EM may conduct a number of independent surveys to verify the Contractors results and observations.

The TSS samples will be collected at upstream and/or downstream locations near the following watercourses:

- Immediately downstream of the active remediation area.
- Downstream of Dam, within the estuary prior to the Northumberland Strait.

Sampling stations will be located within 100 m of the dredging activity and marked to enable future return to the same upstream and/or downstream locations.

The sampling and sample handling procedures will be outlined in the SSEPP – Turbidity Monitoring. Turbidity will be obtained using a handheld turbidity meter in conjunction with automatic dataloggers to collect TSS.

-Following completion of sampling, the Contractor(s) EM shall visually inspect the ESC measures for signs of problems and note the nature of runoff water passing through/around the installations. Visual inspections shall also be carried out at the non-active construction Sites to verify the performance of installed ESC measures. Photographs will be a useful addition to sampling notes. All field notes should be submitted to the CMOC EM in standardized form with a copy to the NSLI.

Should contractor activities have the potential to impact or impact any other waterbodies, the Contractor(s) will develop a Turbidity Monitoring and Reporting Table (Table 7.4) for those activities based on the monitoring strategy and submit to CMOC/NSLI for approval.

The following mitigation methods will be employed to reduce TSS and turbidity while dredging:

- Silt curtains will be installed to contain the sediment within the active dredging area.
- Turbidity monitoring will be conducted immediately outside the active dredging area every 5 hours to confirm that TSS concentrations do not increase above 25 mg/L above background concentrations (or other relevant Site-Specific TSS-turbidity relationship that may be developed as part of the Project).
- If turbidity concentrations immediately outside the active dredging area exceed the acceptable limit, the CMOC will be notified and all dredging activities will cease until levels return to background concentrations.

DRAFT

Table 7.4 Turbidity Monitoring, Action and Reporting Requirements for Boat Harbour and Estuary

Sample Point Location	Frequency	Limit	Action
Background	30-60 minutes before activity/storm begins	• N/A	• N/A
Monitoring Points (to be taken at the points most representative of turbidity outside the construction) at minimum will include: • At each end of any curtain or floating boom. • At any openings (for water flow)	Frequency to be increased for high risk activity monitoring or during incident response as specified	• Consistent exceedances means daily average > 8 NTU above background for 24 hours (The Contractor shall develop a relationship between monitoring and action points)	1. Any single exceedance, Contractor to assess their Site activities and mitigate cause of turbidity if possible. 2. >8 NTU above background for 24 hours average reassess activities and mitigation 3. Reduce construction intensity to prevent an exceedance at the action point. 4. Stop construction activity to prevent exceedance at the action point 5. Report in daily/weekly reports
Action Points (to be taken at the points most representative of turbidity outside the construction zone at a location approximately 100 m downstream of cofferdam)	Frequency to be increased for high risk activity monitoring or during incident response as specified	• >4NTU above background	This is considered an exceedance. Steps to be followed: 1. Contractor to stop in-water work immediately. 2. Notify the CMOC EM of the circumstance of the exceedance including construction activities and turbidity levels. The CMOC EM will notify NSLI of the exceedance. 3. Develop a corrective action plan including mitigation measures to address source of turbidity and prevent re-occurrence and submit to CMOC EM, NSLI prior to resuming work.

DRAFT

Table 7.4 Turbidity Monitoring, Action and Reporting Requirements for Boat Harbour and Estuary

Sample Point Location	Frequency	Limit	Action
Exceedance monitoring points	Every 15 minutes following an action point exceedance	• >4 NTU above background	4. Monitor a minimum of two identified spill monitoring points to delineate the extent of the plume. 5. Should the plume at the 1.8 km spill monitoring point exceed 5 NTU above background, notify CMOC EM immediately 6. Continue to track and delineate the plume further downstream until such time as levels drop below 5 NTU

The upper level criteria defined as a reportable event for turbidity will be 110 percent of background, when background (upstream sample location) is greater than or equal to 80 NTUs. When background is less than 80 NTU, a reportable event will be an increase of greater than or equal to 8 NTU above background.

If an element's turbidity monitoring reveals that the upper level criteria have been exceeded, the construction activities suspected of contributing to the exceedance (e.g., excavation) will be temporarily halted until levels decrease to an acceptable level. During this time, all efforts will be made to rectify the cause of the exceedance.

The Contractor(s) shall then resume turbidity monitoring at an increased intensity level (hourly) to verify that the source activity has been abated. Explanatory details documenting the exceedance and any corrective measures taken will be documented.

7.5.4.3 Water Quantity Monitoring

-Water quantity will be monitored by Contractor(s) to support dredging and dewatering operations. Specifically, as the water quantity relates to permissible mass loading by the dredging dewatering effluent stream.

The water quantity monitoring program includes:

- Install flow measuring equipment (water level, surface water velocity and continuous data logger) at the water level control structure throughout remediation.
- Install and operate one automated meteorological station (precipitation, wind speed/direction, air temperature) at a location approved by the CMOC.GC shall conduct Site visits at a sufficient frequency to ensure that the systems are working properly.
- Maintain system hardware.
- Report all measured data and logs of each daily remote check.

DRAFT

Meteorological Station

The new meteorological station will be installed in a permanent location and:

- Be weather proofed and powered to operate 24 hours per day throughout the year.
- Have precipitation gauge equipped with a heating unit to enable snowfall measurements, in addition to rainfall.
- Record meteorological data in 10 minute intervals.
- Positioned at an appropriate location such that it is away from immediate influences of construction.
- Have the ability to transmit data via the internet to a data managing database.
- Data can be accessed remotely from the central monitoring PC.
- Be calibrated regularly according to the manufacture's specifications.

Data Collection

All flow and meteorological data at the automatic monitoring stations will be collected by the NSLI or a designee of the proponent. Data will be collected automatically at the central monitoring PC via the radio communications system to each remote water level, velocity and precipitation monitoring station. This data will be available anywhere with an internet connection and password.

To ensure that the data collected is acceptable, the system alarms will be reviewed on a daily basis and recorded in a surface water monitoring log.

There will be frequent Site visits to each location to complete a physical Site inspection to ensure that all is in working order. The values of the instrumentation will also be recorded for comparison to logged data. A test sheet will be prepared and documented for each visit. Previous experience with this type of field measurements has shown that brook and tidal environments can be quite damaging for sensors that are, by necessity, exposed. The typical intent of such instruments is to characterize extreme flow conditions, in terms of peak water levels and peak velocities. Such events will usually cause the flow to carry high amounts of suspended solids and debris which are likely to affect or damage the monitoring equipment. The very nature of the monitored event therefore confers some risk to the quality of the monitoring results. The importance of maintaining a continuous record is quite high, since storm events can never be predicted more than 2 weeks in advance. It is therefore essential to maintain the equipment in working order, to be able to measure the precipitation and resulting flow characteristics of a storm that could happen at any time. As a result, the instruments can experience no more than 10 percent downtime, with no more than 5 consecutive days of downtime. This allows an assessment of the general condition of the instrument to be made, as well as allowing a maximum time of 5 days between the failure of the instrument and the diagnosis of the cause of failure of the instruments.

7.5.4.4 Containment Cell Monitoring

As part of CC closure, a surface water monitoring station will be constructed to facilitate on-going surface water monitoring. The system is designed to permit sampling at the stormwater pond outlet.

DRAFT

7.5.5 Terrestrial Habitat and Vegetation

Monitoring of terrestrial habitat and vegetation is limited to the compliance monitoring proposed in the riparian, wetlands and terrestrial environments follow-up program. The Contractor(s) shall prepare a SSEPP using all mitigative measures to be protective of the terrestrial habitat and vegetation. The details of the monitoring programs will be refined and developed in consultation and collaboration with regulatory agencies and scientific advisors as required.

The compliance terrestrial habitat and vegetation monitoring program will be the CMOC responsibility. This program will include the Site preparation and construction and operation phase of the Project. The vegetation monitoring plan will be conducted over a minimum of 3 years, at least twice per year in late May-early June and again in Late August. Any translocation sites will be assessed for the survival and health of translocated rare plant species, will be under the supervision of a Botanist. Measurement criteria will include vegetation growth, percent composition, persistence of rare plants and establishment/spread of invasive plant species.

7.5.6 Wetlands

The Contractor(s) shall prepare a SSEPP complimenting the PEPP to protect wetlands. The details of the monitoring programs will be refined and developed in consultation and collaboration with regulatory agencies and scientific advisors as required.

7.5.7 Mammals and Wildlife

Monitoring will be conducted from the start of remedial activities until the end of decommissioning activities. The details of the monitoring programs will be determined in consultation with regulatory and scientific advisors. The Contractor(s) shall prepare a SSEPP using mitigative measures to protect area mammals and wildlife. The details of the monitoring program will be refined and developed in consultation and collaboration with regulatory agencies and other stakeholders.

Monitoring of remedial activities to evaluate their success in establishing habitat for wild species and monitoring wetlands for condition and integrity may be necessary post decommissioning phase.

The monitoring plan will provide details on effects levels and the effectiveness of mitigation, where applicable. The monitoring plan to assess wildlife populations will be established, with surveys carried out as appropriate times of the year as shown in the Table 7.5.

Table 7.5 Mammals and Wildlife Survey Times

Wildlife Species	Survey Times, Notes
Amphibians	Early May
Reptiles	June-August
Small mammals	June-July (check especially meadow vole activity)
Fur bearers	Fall and Winter (check tracks and other signs)
Deer	Winter (check tracks in areas of previously known concentration)

Evidence of wildlife presence and activity, and vegetation condition requiring attention, will be monitored during the surveys.

DRAFT

Wildlife interactions within the Project footprint are monitored on a daily basis by the GC EM and other construction personnel. The GC is responsible for ensuring all sub-contractors and On-Site personnel are provided with appropriate information and protocols in the event of a wildlife encounter and potential to encounter SAR or of concern. Wildlife sightings will be reported to the GC EM. All reasonable action will be taken to avoid disruption and injury to any wildlife encountered.

7.5.8 Marine Environment

During active remediation stages, the CMOC shall prepare a SSEPP to protect the marine environment at the estuary. The details of the monitoring programs will be refined and developed in consultation and collaboration with regulatory agencies and other stakeholders. The monitoring during remediation is anticipated to consist primarily of regular observation and documentation.

An ESC Plan will be developed and implemented. The ESC Plan will include a monitoring program for Site runoff and will be reviewed and approved by NSEL. Mitigation plans for environmental impacts due to contaminated soils and sediments from the Project Site will be implemented using risk and remediation management plan which will be approved prior to construction.

Post-remediation monitoring is not part of the CMOC or Contractor(s) works at this time but will be undertaken by NLSI through an independent consultant. The specific parameters that will be measured during post remediation monitoring will be confirmed based on the results of the HHERA and through conversations with scientific advisors.

The following estuary monitoring of the marine environment is recommended:

- Sediment contamination sampling along the pipeline corridor.
- Monitoring of remedial activities to evaluate their success in establishing high quality aquatic habitat after remediation.
- Areas within the estuary will be re-evaluated following remediation of the Site to identify trends or impacts to wetlands due to project activities.
- The specific parameters that will be measured and the frequency during post remediation monitoring will be confirmed based on the results of the HHERA and through discussions with regulators. Parameters that should be monitored include water quality, sediment composition and quality, benthic community composition and contaminants within biota. The post remediation monitoring will be documented in the Annual Compliance Report (see Section 9 for further details).

7.5.9 Fish and Aquatic Habitat

The Contractor(s) shall prepare a SSEPP using BMPs to protect Fish and Aquatic Habitat. The details of the monitoring programs will be refined and developed in consultation and collaboration with regulatory agencies including NSDFA and DFO and other stakeholders.

The determination of appropriate Fish and Fish Habitat Monitoring program are proposed in Table 7.6 and is based on the knowledge of Nova Scotia biophysical conditions.

Pre-Construction and Post-remediation monitoring is not part of the CMOC or Contractor(s) works at this time but will be undertaken by NLSI through an independent consultant. The CMOC EM is

DRAFT

responsible for erosion and sediment control monitoring as outlined elsewhere in this document, as well as annual photographs and reporting for description/photographs of aquatic and riparian habitat.

Table 7.6 Proposed Marine Environmental Monitoring

Wildlife Species		Monitoring Program Elements
Phase	Component	
Pre-Construction	Project Site	• Survey fish communities in all On-Site watercourse by electrofishing and by trap netting in Harbour Bay • Collect and determine assimilative capacity
Construction	Project Site	• Inspect/monitor sediment/erosion control measures at each On-Site watercourse • Annual Fish community survey in all On-Site watercourses discharging into BH, and downstream of the dam. • Annual description/photographs of aquatic and riparian habitat • Prepare annual reports to present results of the erosion control monitoring and the annual fish surveys and compare results (species presence, composition etc.,) with previous years. •
Post-Remediation	Project Site	• Confirmatory sampling of BHSL and Basin • Fish Community surveys in all On-site watercourses and Harbour Bay for post-construction monitoring will likely include a minimum of 1-5 years if required • Describe/photograph aquatic/riparian habitat • Prepare report on results of the annual habitat and fish surveys, compare results to previous years.

The fish community will be monitored using a variety of techniques employed to study fish and aquatic habitat during development phases of the Project to ensure compliance with prescribed mitigation and recommend additional mitigation measures and/or remediation where deemed necessary.

The data will be collected from the same location sampled and methodologies consistent with data collected during baseline studies when feasible.

- Monitor the effects of the Project components on water and sediment quality downstream of BHSL and within associated watercourses.
- Monitor the Project components and operation effects associated with flow fluctuations and water level and fish stranding within associated watercourses.
- Monitor the effects of the Project on physical aquatic habitat.
- Confirmatory sampling of BHSL and Basins will be conducted after remediation has been completed.

DRAFT

7.5.9.1.1 Water Quantity

The flow of water in a stream is a master environmental variable that defines and forms fish habitat and influences productive capacity. Low water flows can impact fish survival and reproductive success by increasing temperatures, lowering oxygen concentrations, and hindering spawning and migration behaviour. In general, flow modification and alteration influence the productive capacity of aquatic habitat. Hydrometric monitoring of stream discharge will measure compliance with the terms and conditions set forth in the Fisheries Act Authorization to protect fish and fish habitat.

Accurate, real-time instantaneous flow data will be monitored through the life of the Project to ensure compliance with the water licence, and to provide measures of environmental conditions that will assist in the interpretation of changes in biological components of the monitoring program as outlined in Section 7.4.4.

7.5.10 Migratory Birds

The Contractor(s) shall prepare a SSEPP using BMPs to protect migratory bird nesting activity during active remediation stages to facilitate the identification and protection of active nests (refer to subsection below). The details of the monitoring programs will be refined and developed in consultation and collaboration with regulatory agencies and other stakeholders.

Bird monitoring programs during active remediation stages will be the responsibility of the CMOC EM to coordinate and maintain.

The bird monitoring program will include the following:

- Verify the effectiveness of mitigation measures related to heavy machinery usage in/around wetland areas, and areas (if any) where excessive light pollution may disorient or attract avian species.
- Should Project activities occur during the breeding bird season, a nest survey should be conducted within 3 days of any Project activity occurring. Should a nest be identified, a buffer must be established and the nest is to be monitored.
- Monitor known nests near equipment or material stockpiles and exposed areas from a distance with a spotting scope or binoculars to verify the effectiveness of the buffer until the nests are inactive.
- Conduct routine inspections as directed by regulators. Inspections are anticipated to be conducted daily by operators, and as required by qualified avian experts during the remediation phase of the Project and all other phases that interact with directly or in-directly with those areas.

7.5.10.1 Nest Surveys Protocols

Observations of shorebird nesting activities by the Contractor(s) staff and the CMOC EM will be documented for the habitat particularly within BHETF estuary outlets and at berm locations during May to August nesting season. Nest surveys will be completed for all construction and operational activities scheduled during key nesting periods (as defined by Environment Canada's Breeding Bird Survey, and/or Maritime Breeding Birds Atlas (MBBA) and specific to each breeding bird). In most instances where construction work cannot avoid the key nesting period, a single pre-construction

DRAFT

migratory bird nest survey will be completed, typically a maximum of 7 days before the construction or operation activity, to adjacent to the disturbance footprint. These surveys shall be conducted in both forested and non-forested habitats and wetlands, as well as any anthropogenic habitats that may be affected. If deemed necessary, an avian monitor shall be used to monitor active nests and assess any nests discovered during construction.

The nest survey is a search for nests using systematic techniques assisted by cues from birds (e.g., protective behaviour, scold calls, flushing). Methods used for nest surveys may include:

- Walking, in a systematic manner (i.e., transects, point and line), through the entire area proposed for clearing and/or topsoil conservation.
- Examining the ground, shrubs and trees for nests.
- Scanning for unpredictable movement of vegetation, not related to the wind.
- Vantage point watch -responding (i.e., attempt to get a visual) to all singing males and calling females and males.
- Recording all bird sign and any sign of breeding activity evidence (i.e., singing males, female and male together, copulation, birds carrying nesting material or food, presence of a nest or nestlings, presence of fledglings).
- Surveys should begin at or within half an hour of sunrise and completed within 4 1/2 hours or by 10:00 a.m. whichever comes first.

While searching for nests, observers will be aware of a bird's response to their presence. During nest-building periods, observers will not get too close to the suspected nest, and will verify only when the female is absent, to prevent abandonment. During incubation, if a female is behaving as if there is a nest in the area but does not appear to be going to it, the observer will leave the area so that the female can return to her nest.

Data recorded for located nests are:

- Species
- UTM coordinates using a hand-held GPS, distance to the applicable Project component (e.g., ROW or facility boundary), and any species recorded outside the 100 m radius
- Date and time of day
- Weather conditions (e.g., precipitation and visibility), including temperature, visibility, wind speed
- Photos
- Site description (i.e., tree or shrub species, height of nest, type of nest, direction cavity faces)
- Stage of nesting (i.e., construction stage; eggs, including number; hatchlings; almost fledged)
- Additional information about adult bird presence/absence or behavior
- Point counts outside of the 10 minute survey window
- Flyovers are recorded as incidentals

If vegetation clearing, soil handing and grading has occurred, but Project activity is planned during the breeding season, no further migratory bird nest surveys are required.

DRAFT

If remediation or restoration occurs during the breeding bird window, the soil piles and direct area of disturbance will be checked by the EM's and any active nests that are found will be marked and the appropriate buffers established to reduce the risk of disturbance to the nest. No searches will be done in the surrounding undisturbed areas during restoration. Restoration practices are not expected to cause significant disturbance to birds nesting adjacent to the disturbance footprint because the restoration process from soil replacement to seeding is of short duration and is a low-magnitude disturbance.

Vegetation management activities that may occur during the migratory bird breeding period should be assessed by a qualified individual to determine the potential risk to breeding migratory birds. Based on this assessment, if there is potential for an incidental take of migratory birds (e.g., mowing), conduct migratory bird nest surveys in the affected area before starting vegetation control.

The following measures may also be undertaken or considered during migratory bird nest surveys:

- Migratory bird nests surveys are conducted anywhere between April 15 to August 30. This timeframe accounts for the laying, incubation, hatchling and fledgling stages of several bird guilds including passerines, upland nesting shorebirds and waterfowl.
- In areas of suitable habitat during the migratory bird breeding window, nest searches should be conducted in the disturbance footprint and a suitable buffer on either side of the footprint (e.g., 30 m in forested habitat, 50 m in grassland habitat, and wetlands within 100 m); in addition to point count surveys (for SARA-listed migratory birds). The nest search buffer for breeding waterfowl or waterbirds will depend on the recommended nest buffer; consult with appropriate regulator(s) prior to nest searches.
- Individuals completing the migratory bird nest surveys must be aware of both provincially or territorially listed and SARA-listed SAR that may be found in the Project area (on and off the disturbance footprint).

7.5.10.2 Non-Forested Habitats

Procedures for conducting a migratory bird nest survey in regions dominated by native grasslands and tame pasture or haylands are described below (note – surveys in cultivated lands are not recommended), including required Site information, the detail of information expected and the rationale for specific methods (where applicable).

- Nest searches will be completed from sunrise until 1800 hours and should be discontinued during high winds or any precipitation. Searches can be continued until approximately 1800 hours as most nesting birds can still be flushed off their nests throughout the day. Some exceptions exist, particularly for certain species. For Sprague's Pipit, for instance, nest searches (generally undertaken after a territorial display has been observed) should be done between sunrise and 1000 hours or from 1700 hours until dusk. Pre-construction migratory bird nest surveys should be completed a maximum of 7 days before the construction or operation activity.
- For tree or shrub nesting migratory birds, transects will be walked through treed and shrub areas looking for nests, to confirm if any nests found are active. The number of qualified individuals required will depend on the amount of cover present; for example, shelterbelts and small riparian area may require only one qualified individual.

DRAFT

The following measures apply specifically to ground nesting birds:

- The entire length of the disturbance footprint and buffers through suitable habitat will be surveyed for active migratory bird nests using a line transect method (i.e., slowly walking transects parallel to the active work area, approximately 5 to 10 m apart). If the disturbance footprint is greater than 30 m wide, the boundary of the disturbance footprint can be marked to facilitate transects.
- When a bird is flushed, efforts should be made to attempt to identify the bird species (e.g., using identifying behaviour and distinguishing characteristics [e.g., tail shape, tail bars, colours] and, if necessary, following the flushed bird to obtain a better observation point), after which searching for the nest will begin.
- Visually mark the location of a flushing bird (i.e., using changes in vegetation, presence of sagebrush or other shrubs, micro-relief).This is especially important when searching for birds that flush at greater distances.
- When searching for the nest, attempt to minimize effects by limiting the search effort to 5 minutes, taking care to study the ground surface and vegetation before each step to prevent stepping on the nest. If the nest is not located, assume a nest location from the approximate location the bird flushed from as well as the species and behaviour of the flushed bird.
- Some shorebirds (e.g., killdeer, American avocet, and yellowlegs) secretly leave their nests and may display a "broken wing" behaviour in an attempt to lure intruders from the nest area. To confirm the location of the nest, observers can move 50 to 100 m away to sit and wait until the bird returns to its nest.
- If a previously identified active nest of any migratory bird is determined to be currently inactive (i.e., fledging has occurred), compliance with the MBCA is still required. A resurvey for other migratory birds may be required, depending on whether the last nest search was conducted within the last 10 days and whether activities are still planned during the migratory bird breeding window.

7.5.10.3 Forested Habitats

Procedures for conducting a migratory bird nest survey in forested regions are described below, including required Site information, the detail of information expected and the rationale for specific methods (where applicable).

- Nest searches will be completed from sunrise until 1000 hours or from 1700 until dusk and should be discontinued during high winds or any precipitation. In forested habitat, nests are extremely difficult to find, so detection of birds exhibiting breeding behaviour is the main objective.
- The entire length of the disturbance footprint and buffers through suitable habitat will be surveyed for active migratory bird nests using a line transect method (i.e., qualified individuals slowly walking transects parallel to the Project component, 5 to 10 m apart; distance between transects will depend on vegetation cover). If the disturbance footprint is greater than 30 m wide, the boundary of the disturbance footprint can be marked to facilitate transects.

DRAFT

- Non-intrusive searching methods are recommended in forested habitats. Qualified individuals will primarily search for breeding behaviour (indicating the potential presence of an active nest) using point counts placed along transects, as detectability of nests in forested habitat is very low.

7.5.10.1 Wetlands

Nest surveys for waterfowl and waterbirds will depend on the presence of semi-permanent and permanent wetlands. For most water bird species, birds generally nest in or adjacent to semi-permanent and permanent wetlands or waterbodies (e.g., creeks). As such, all semi-permanent and permanent wetlands and waterbodies within the recommended nest buffer (consult with appropriate regulator(s) of the disturbance footprint should be searched for breeding waterfowl and waterbirds).

For some species of waterfowl, nesting occurs upland, away from wetlands. The nest search buffer for breeding waterfowl or waterbirds will depend on the recommended nest buffer; consult with appropriate regulator(s) prior to conducting nest searches (generally wetlands within 100 m of the Project component should be searched as per recent guidance from Environment Canada, and/or MBCA). In order to survey for upland nesting waterfowl, aerial photographs should be reviewed for the presence of semi-permanent and permanent wetlands within and surrounding the disturbance footprint (distance outside the disturbance footprint will depend on recommended nest buffer). Where these wetlands occur, a search buffer (based on the recommended nest buffer; e.g., 100 m) beyond the disturbance footprint should be established. The length of the search buffer along the disturbance footprint will depend on how close the wetland is to the footprint.

Nest searches should be completed from sunrise until 1800 hours and should be discontinued during high winds or any precipitation. Searches can be continued until approximately 1800 hours as most nesting birds can still be flushed off their nests throughout the day.

7.5.10.2 Identification and Protection of Active Nests

The disturbance footprint for most projects will likely include potential nesting habitat for many migratory bird species (both ground and tree or shrub nesters). The presence of natural upland and wetland habitat in the disturbance footprint increases the chances of having nesting migratory bird species On-Site.

Nests could be located in trees or shrubs or on the ground. An active nest can be identified by:

- The presence of birds or eggs in a nest.
- Adult birds carrying food or nesting materials to a specific location.
- Adult birds defending territory, through singing, screeching, or diving.

When one or more of these indicators are noted, measures should be undertaken to identify if the potential location of the nest is in the disturbance footprint and disturbance buffer.

The size of the buffer is based on the nest location, the sensitivity of the bird species to disturbances during nesting, the type of construction activity that will be undertaken in the vicinity of the nest, and the status of the bird species (i.e., rare or protected under provincial/territorial or federal legislation). For instance, the recommended buffer for most passerines is 30 m in the boreal forest and 50 m in

DRAFT

grasslands, and 100 m for most waterfowl and water bird species; professional judgment can be used when modifying the setback buffer. However, this will be allowed only for construction-related activities that are less intensive (i.e., no heavy equipment). Buffers of less than 10 m will likely not be large enough to protect the nest's viability.

Marking of active nests with flagging tape or a painted lathe may cause increased predation of the nest. It is recommended to mark the location of the nest site on a GPS unit and/or recording bearing and distance from an established marker on the landscape in order to re-check the nest activity status at a later date.

If an occupied nest is discovered on or adjacent to the Project activity during construction, activities within the recommended setback of the nest (i.e., depending on region, habitat, and species) should be stopped until the Contractor(s) EM and CMOC EM has been notified. Once the EM's are notified, an avian monitor will be dispatched to the Site (if not already present) to identify the occupant(s) and determine the appropriate mitigation.

Setback buffers for provincially listed and SARA-listed bird species will be refined through regulatory consultation and outlined in the SSEPP.

If no construction work is allowed in a setback buffer, it should be noted that larger equipment (e.g., graders and side booms) will likely have to be marshaled through the buffer along the Project activity; more mobile equipment could go around if necessary. If this is to occur, monitoring by a qualified individual or properly trained employee may be required. And it is recommended that larger equipment only pass through the setback buffer once while the nest is active.

In order to reduce the potential for nest abandonment or failure, monitoring or rechecking of an identified active nest should be timed to occur after the fledging period (or when the young have left the nest) for migratory birds designated as SAR or at minimum 10 days for other migratory birds. Depending on the nesting stage (i.e., incubating or fledging) observed during the nest search, the timing of follow-up nest checks will be determined using literature-based estimates of the species-specific incubation and fledging periods (i.e., approximate number days for incubation and/or fledging to be completed).

7.5.11 Species at Risk

The Contractor(s) will be responsible to develop a SSEPP to protect SAR. The details of the monitoring program will be refined and developed in consultation and collaboration with regulatory agencies and other stakeholders.

Environmental monitoring shall take place after the Site is decommissioned, at wetland areas found near the CC, and the water quality will be monitored at the mouth of the BHSL. Post-remediation monitoring is not part of the CMOC or Contractor(s) works at this time but will be undertaken by NLSI through an independent consultant.

Monitoring of remedial activities to evaluate their success in establishing habitat for wild species and monitoring wetlands for condition and integrity may be necessary post decommissioning phase.

DRAFT

7.5.11.1 Black Ash

Black Ash is a broadleaved hardwood tree reaching a height of 15 m to 27 m and is classified as a facultative wetland or facultative wetland and species throughout its range. It occurs most frequently in floodplain forests, basin, seepage and lacustrine swamp forests margins and fens.

7.5.11.2 Common Nighthawk

Common Nighthawk habitat is located within the Study Area. Common Nighthawk nests on the ground in open land or forest clearings, or on gravel roofs in cities. The Contractor(s) must ensure -all personnel working at the Site are familiar with and will comply with, the requirements of the MBCA as well as the federal SARA. Common Nighthawk are provided additional protection under SARA.

7.5.11.3 Bank Swallow

Bank Swallow habitat is located within the Study Area. Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lakes and ocean buffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. The Contractor(s) must ensure that all sub-contractors and personnel working at the Site are familiar with and will comply with, the requirements of the MBCA as well as the federal SARA.

7.5.11.4 Barn Swallow

Barn Swallow habitat is located within the Study Area. Barn Swallows have adapted to nesting in a variety of artificial structures (barns, bridges etc.,) and to exploit foraging opportunities in open, human-modified, rural landscapes. They nest mostly in caves, holes, crevices and ledges in cliff faces. The Contractor(s) must ensure that all sub-contractors and personnel working at the Site are familiar with and will comply with, the requirements of the MBCA as well as the federal SARA.

7.5.11.5 Canada Warbler

Canada Warbler habitat is located within the Study Area. Canada Warbler breeds in a variety of habitats but is almost always associated with moist forests with a dense, deciduous shrub layer, complex understory and available perch trees. The Contractor(s) must ensure that all sub-contractors and personnel working at the Site are familiar with and will comply with, the requirements of the MBCA as well as the federal SARA.

7.5.11.6 Piping Plover

Piping Plover habitat is located north of the Study Area. Piping Plover nest on sandy beaches. The Contractor(s) must ensure -all personnel working at the Site are familiar with and will comply with, the requirements of the MBCA as well as the federal SARA. Piping Plover are provided additional protection under SARA. The construction blackout period, with no planned activities for the Project is defined as May 1 to July 31 to avoid the most critical part of the Piping Plover nesting season; however, there is potential for Piping Plover and other migratory birds to nest outside of the blackout period. To avoid potential impacts on Piping Plover nesting outside of the blackout period, the Contractor(s) must:

DRAFT

- Conduct daily Site monitoring if work is scheduled between August 1 and September 30 or between April 15 and April 30 and in the vicinity of Piping Plover habitat.
- Establish a 300 m buffer around Piping Plover nests found during surveys (to remain in place until the young have naturally left.
- Report all sightings of migratory bird individuals and/or nests to the Contractor(s) EM, CMOC EM and ECCC's Canadian Wildlife Services.

The GC must submit an Offsetting Implementation and Monitoring Plan to mitigate impacts on Piping Plover critical habitat that is consistent with the 202 and the draft pending 2019 "Piping Plover Recovery Strategy" as well as ECCC's "Operational Framework for Use of Conservation Allowances". The plan should include a baseline assessment and post-construction monitoring of both On-Site and Off-Site offsets at years 1, 3, 5, and 10. A draft Offsetting Implementation and Monitoring Plan must be submitted to the NSLI (via CMOC EM) for review.

7.5.12 Mi'kmaq of Nova Scotia

The objectives for follow-up monitoring in relation to Mi'kmaq of Nova Scotia and specifically to PLFN are to ensure that there are no significant temporary effects to human health during remediation activities, as well as to confirm the safety of human interaction with the environment post-remediation with regard to resuming traditional land and resource uses.

Routine noise, light, and air monitoring will provide indicators of changes to the environment from the Project in order to remain in regulatory compliance regarding Project-generated emissions and will ensure human health and safety as a priority.

Specific additional studies will be determined based on compliance and post-remediation activities including long-term monitoring of the CC. Long-term follow-up monitoring will be in alignment with the HHERA to verify remediation effectiveness and confirm the safety of recreational use and direct contact with sediment (incidental and dermal contact) and with plants, fish, shellfish, and game (organs) through ingestion. Specific parameters that will be measured will be confirmed based on the results of the HHERA and in consultation with regulators.

Post remediation monitoring of country foods (such as edible fish, shellfish, birds and/or aquatic plants) will be conducted within the remediated sediment areas (aquatic areas) at the Site. Country foods sampling requirements will be determined based on the results of the HHERA.

A second PLFN well-being survey will be conducted once remediation activities have been completed to assess and document any related changes in well-being.

With regard to ensuring potential positive effects related to employment and that opportunities are available, follow-up with contractors, potentially in the form of an audit, will be conducted to ensure meaningful employment opportunities are offered to PLFN and local residents as a priority. Annual reporting requirements of employment statistics through federal funding mechanisms will also support this objective.

7.5.13 Economic and Social

With respect to potential effects related to increased stress and damage to road and highway infrastructure, the Proponent will monitor roads and highways and liaise with NSTIR as needed to

facilitate repairs. There is no other determined need for compliance or effects monitoring programs related to effects on the economic and social environment.Follow-up monitoring of the economic environment is not contemplated by NSLI for non-PLFN aspects nor is monitoring for the non-PLFN social environment. Routine air monitoring will provide indicators of changes to the environment from the Project in order to remain in regulatory compliance regarding Project-generated emissions.

7.5.14 Archaeological/Cultural Heritage Resources

Members of PLFN community will be given the opportunity to be On-Site during all ground disturbance work.

In the event that human remains or intact archaeological deposits are encountered during any work associated with Project Components/Activities, all work in the associated area(s) should be halted and immediate contact made with the Coordinator of the Special Places Program (Sean Weseloh McKeane: 902-424-6475). If human remains are encountered, immediate contact should also be made with the Assembly of Nova Scotia Mi'kmaq Chiefs (ANSMC) via the Kwilmu'kw Maw-klusuaqn Negotiation Office (Heather MacLeod -Leslie: 902-843-3880).

An exclusion zone of 100 m surrounding the area will be established should any cultural resources be encountered. If human remains or intact archaeological deposits are discovered no further ground disturbance work will be permitted at the Site until approval has been received from the appropriate regulatory agency to resume the work.

7.5.15 Human Health

Routine air monitoring will provide indicators of changes to the environment from the Project in order to remain in regulatory compliance regarding Project-generated emissions. Proposed monitoring programs associated with Air Quality and Odour are detailed in Section 7.3.8. Country Food Monitoring and follow-up monitoring to the HHERA pertinent to Mi'kmaq human health are detailed in Section 7.3.19.

7.1 Long-Term Monitoring

Long-term monitoring outlined in Section 7.4 of the EMP prepared under separate cover, is not part of the construction phase of the Project but was included provide an inclusive view of the ongoing monitoring that will carry on post-remediation.

7.2 Record Keeping

The GC shall maintain all communications and records associated with activities related to the PEPP.

All environmental related communication from the GC shall be provided to the CMOC EM. The CMOC EM is responsible for communicating with NSLI. The GC will not communicate directly with NSLI, rather use the CMOC EM as an intermediary. Environmental communications could consist of:

- Phone calls
- Emails

DRAFT

- RFI's
- Daily, weekly, and monthly reports and/or meeting minutes
- Environmental Incident Reports
- Wildlife observation reports (Appendix D-3)

The GC and CMOC EM will conduct the following to establish and maintain communication between all parties:

- Initiation meetings prior to commencing initial works
- Bi-weekly project meetings during active Project times
- Meetings during winter season (while Project is inactive) to confirm Project is on track for upcoming active season

Environmental record keeping will be completed by the GC. The GC will keep copies of all environmental communications for auditing purposes. Digital copies of communications and reports will be acceptable in lieu of hard copies.

All external communications will be channeled through the CMOC EM.

The GC will be responsible for communicating the results of all environmental inspections to the CMOC EM through the completion of inspection reports to be kept at the Site, and through the submission of detailed reports as required. A sample of this inspection report must be included in the GC Site-Specific EPP(s). Any deviations from this PEPP and/or Site-Specific EPP(s) or issues that need to be addressed will be communicated to the CMOC EM verbally as they are identified, and in writing on the same day. Documentation will be completed of all steps taken to address deviations including the measures employed and the relevant date.

8. Environmental Incident Reporting

All environmental incidents will be investigated immediately following all action to stop and/or contain an exceedance or spill has been completed and following the initial verbal report to the Contractor(s) EM and CMOC EM.

For the purpose of this Project, the following events or occurrences shall be considered "Environmental Incidents":

- Any release of sediment into the wetland or natural environment surrounding the Site, including any exceedances resulting from dredging activities.
- Accidental discharges of contaminated sediments during dredging.
- Unauthorized serious harm to fish or impacts to wildlife (e.g., encroachment into prohibited areas, removal of vegetation during nesting periods).
- Release of effluent from the temporary wastewater treatment facility above effluent criteria.
- Leachate storage tank failure/tanker truck spill.

DRAFT

- Identified harm to wildlife as a result of work activities including road mortality on the access road.
- Spills of any chemical or hazardous material including fuels and concrete.
- Fires related to construction activities.
- Unauthorized release of air pollutants.

In the event of an environmental incident, the Contractor(s) shall:

- Stop all work in the immediate area or activities contributing to the event and mobilize resources as required to safety stop the source of the event.
- Mobilize resources as required to safety contain the exceedance, spill, or other environmental impact.
- The actions shall take precedence over notification; however, depending on the severity of the event notification may be required concurrently.
- Initiate preliminary remedial action to stabilize the Site.
- The Contractor(s) shall notify the NSLI (via CMOC EM) immediately upon discovery of the incident, who will then follow the communication protocol outlined herewith in.
- Notify the Maritimes Regional Office, CCG, DFO as specified in this PEPP Section 8.2 and as directed by the Contractor(s) EM/CMOC EM and NSLI. The Contractor(s) shall produce a report on follow up actions to incidents (e.g. spills, wildlife impacts etc.) to ensure the files are closed.

As with all incidents, health and safety or otherwise, environmental incidents shall be investigated to:

- Identify what occurred.
- Identify approximate time, extent, and duration of the incident.
- Identify areas, resources or habitats affected.
- Provide results of any sample analysis taken in conjunction with the incident (e.g., water samples).
- Determine the basic cause of the incident.
- Ensure immediate controls are implemented to ensure the environmental impact is minimized or completely mitigated.
- Complete a preliminary incident report required to be issued by the Contractor(s) before the end of the shift in which the incident occurred.
- Complete a final incident report including the identification of basic causes and the corrective action implemented, including controls to address basic causes to prevent future incidents. This shall be considered an important tool of the adaptive management process in meeting discharge criteria and environmental objectives.

DRAFT

8.1 Roles and Responsibilities

Contractor(s)

It is understood that Contractor(s) will notify the NSLI (via the CMOC) in verbally and writing of observed non-compliance with Federal environmental laws or regulations, permits, and other components of the PEPP. After receipt of such notice, the Contractor(s) will inform NSLI (via the CMOC) of the proposed corrective action and apply it On-Site if NSLI agrees with the solution. If the corrective action falls within the Contractor's scope of work, the Contractor(s) shall implement the corrective action and advise the EM's accordingly. If corrective actions fall outside of the Contractor's scope of work, the Contractor(s) shall receive approval from the CMOC EM to temporarily cease work until the CMOC (on behalf of NSLI) employs an appropriate contractor to implement corrective action.

Environmental Incident Reporting will be the responsibility of the Contractor(s) EM, and will be completed as soon as reasonably possible. In the event of an environmental incident, the Contractor(s) will notify the CMOC EM, and the CMOC will inform NSLI. A preliminary written incident report will be submitted to the CMOC EM by the end of the shift in which it occurred.

The GC shall contact the CMOC EM in the following situations:

- Provision of regular monitoring and summary reports of Site activities
- Notifications of any changes in the Project schedule or order of activities to be completed
- Request for approval to modify the PEPP if deemed necessary
- Reporting of any incidents occurring on the Site including spills, remedial actions, and increased preventative measures

8.2 Wildlife Encounter

In the event of wildlife entering the Site, the following protocol is to be followed:

- Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contractor(s) and the Environmental Coordinator shall be notified. Personnel will stand back and allow the animal to leave the Site. The wildlife should not be approached or handled. The Contractor(s) will contact NSLI (via the CMOC). Only a qualified professional should handle or relocate an animal.
- A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wildlife observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will be used to track wildlife activity throughout the BHETF, and this information can be used to install signage, if appropriate, in areas with high wildlife sightings.
- Should a Contractor employee observe the animal be resident within the Site (remaining on Site longer than 24 hours), injured, or eggs/nests are observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and the CMOC EM shall be notified for direction. The Contractor EM will enact mitigative measures as well as reporting

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protocols. If necessary, the Environmental Coordinator (EM) shall contact NSLI's Environmental Assessment (EA) Staff (via the CMOC) regarding directions to proceed.

8.3 Uncontrolled Release of Fines

Damage to or malfunction of erosion control measures could contribute to uncontrolled release of fines. Uncontrolled release of fines could have potential effects on water quality, aquatic ecosystems and other environmentally sensitive areas.

8.3.1 General Environmental Mitigation Measures

The following procedures shall be implemented to minimize the potential environmental effects in the event of uncontrolled release of fines:

- The individual first noticing the release will immediately report the incident to the Contractor EM and CMOC EM and take necessary measures to repair or correct the problem so as to contain the fines.
- The Contractor responsible for the incident with the approval of the CMOC has full authority to make decisions regarding the immediate course of action.
- The Contractor will notify the NSLI (via CMOC EM) of the situation and obtain from the NSLI/CMOC on the preferred longer term course of action.
- If the release has affected or has the potential to affect a sensitive area, the NSLI (via CMOC EM) will contact and consult with the appropriate regulatory authorities (i.e., DFO) as required for notification or remedial planning.

8.4 Spill Response Procedure and Incident Reporting

Each SSEPP will include a section specific to spill response and reporting that is suitable for the specific work being completed and covered by each Contractor. SSEPPs will include response, notification, and contingency planning as minimum requirements.

In the event of a spill, the Contractor(s) must take appropriate actions to immediately contain and clean-up the spill following the prepared PEPP. Remediation must be conducted in accordance with provincial regulatory requirements and any documentation, testing, and results must be maintained. In the event of an emergency the Contractor(s), Contractor(s) EM and CMOC EM have the obligation to stop work whenever such a stoppage may be necessary to ensure the protection of the environment.

The Contractor(s) shall report an incident or spill in accordance with, and following the obligations outlined in:

- N.S. Reg. 16/2013 – Environment Emergency Regulation
- N.S. Reg. 64/2012 – Contaminated Site Regulations

Incidents are events that are not part of any planned activity or normal operation of the Project. For the purpose of this Project, the following events or occurrences will be considered 'Environmental Incidents' and will be investigated and reported:

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- Any release of sediment into the wetland or natural environment surrounding the Site, including any exceedances resulting from dredging activities.
- Accidental discharges of contaminated sediments during dredging.
- Unauthorized serious harm to fish or impacts to wildlife (e.g., encroachment into prohibited areas, removal of vegetation during nesting periods).
- Release of effluent from the temporary wastewater treatment facility above effluent criteria.
- Leachate storage tank failure/tanker truck spill.
- Identified harm to wildlife as a result of work activities including road mortality on the access road.
- Spills of any chemical or hazardous material including fuels and concrete.
- Fires related to construction activities.
- Unauthorized release of air pollutants.

8.4.1 Response-Action Plan

In the event of a fuel or hazardous material spill, the following procedures will apply:

- The individual who discovers the spill should respond immediately. Immediate response procedures depend on the severity of the spill but, generally, this individual should take available measures to stop the spill, contain the spill to minimize potential damage, and to clean up the spill. Then, as conditions dictate, this individual should call for assistance for stopping, containing and/or cleaning up the spill.
- All spills, regardless of size, will be reported verbally to the Contractor EM and CMOC EM immediately upon implementation of (a) above. The Contractor EM will have the full authority to take appropriate action without unnecessary delay. Small equipment leaks and drips do not have to be reported, but they must be prevented by using drip pans or cleaned up with rags or other appropriate means.

The Contractor EM will have a copy of the PEPP/SSEPP which outlines the response action, and will halt work in the immediate area and report the spill as follows:

- If (a) the spill is greater than 5 litres or, (b) any spill, regardless of size, that has the potential to affect a sensitive environment, must be reported to the CCG immediately via 1-800-565-1633. This CCG Emergency Response number operates 24 hours a day, 365 days a year.
- If the spill is less than 5 litres and does not have the potential to affect a sensitive environment, report to the NSLI (via CMOC EM) by the next working day.

For all spills that are called in to the CCG, an Environmental Incident Report Form (will be prepared by the Contractor(s)) will be completed by the Contractor EM to log the spill and the response actions. A copy of the completed Form will be forwarded to the NSLI, and a copy retained by the Responsible Person. As required, the CCG is to be contacted regardless of the time of day or day of the week.

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The following information is typically requested by the CCG:

- Name of person reporting the spill and their phone number
- Time of spill
- Time of detection of spill
- Type of product spilled
- Amount of product spilled
- Location of spill
- Source of spill
- Type of accident - collision, rupture, overflow
- Owner of product and phone number
- If the spill is still occurring
- If the spill is contained, and if not, where it is flowing
- Cleanup efforts already underway
- Wind velocity and direction
- Temperature
- Proximity to water bodies, wells, water intakes, and buildings
- Snow cover and depth, terrain, and soil conditions

Any spill necessitates immediate On-Site response. Therefore, spill response equipment will be stored On-Site or at an appropriate alternative, with personnel trained in emergency response available during every shift. The Contractor EM will assume the overall responsibility of coordinating a clean-up and maintaining this contingency current and up-to-date. In organizing a clean-up of a spill in the aquatic environment or other environmentally sensitive area, the Contractor EM, in consultation with the CMOC EM and CCG, will assess Site conditions and the environmental effects of various containment and cleanup procedures including the following:

- Immediately mobilize containment and clean-up equipment and personnel.
- Deploy a floating boom or approved alternative as required.
- Assess potential for fuel recovery versus burning.
- Deploy On-Site personnel to build containment dykes and commence dumping containment in drums or, if drainage system is involved, leakage will be isolated by digging a sump, deploying a pollution boom around area, or a combination of both.
- Apply absorbent material for final clean-up.

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- Dispose of all contaminated soil, debris, cleaning materials, and absorbents in compliance with Provincial legislation.
- Non-petroleum based hazardous materials need to be dealt with on an one-by-one basis for handling and disposal. The Contractor EM is to contact the NSLI (via COMOC EM) to make the necessary arrangements for such materials.
- Locate, map, and stake boundaries of contaminated beach and landfill for future treatment and monitoring.
- Assess and appropriately treat any areas disturbed by cleanup activities.
- Review causes of spill with personnel and take all necessary precautions to prevent reoccurrence.

For spills less than 5 litres and not in an aquatic environment, the Contractor EM shall take the appropriate actions to contain and clean up the spill, and also report the spill and cleanup to the NSLI (via CMOC EM) by the next working day.

- The use of chemical dispersant to treat oil slicks will occur only under the authorization of the NSLI and Environment Canada.
- In the event of an apparent fish kill within the Project area, the Contractor EM will notify the CCG and the NSE through the Environmental Emergencies 24-hour Report Line at 1-800-565-1633. The Contractor EM will have the full authority to take appropriate action without unnecessary delay.

9. Closing

This PEPP has been prepared to provide a framework for avoidance and mitigation of environmental impacts associated with the remediation of BH. The commitments outlined herein are based on the Project information available at the time of production and may require adaptation to changes in design, approach, and/or schedule. This report should be read in conjunction with the construction drawings and Project specifications. In the case of discrepancy between these documents, the more stringent approach/threshold will be applied such that best management practices are implemented to mitigate impacts to the natural environment.

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Appendices

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Appendix A
Emergency Contact Numbers
(TO BE PROVIDED BY CONTRACTOR AFTER CONTRACT IS AWARDED)

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Appendix B
Sample Figures

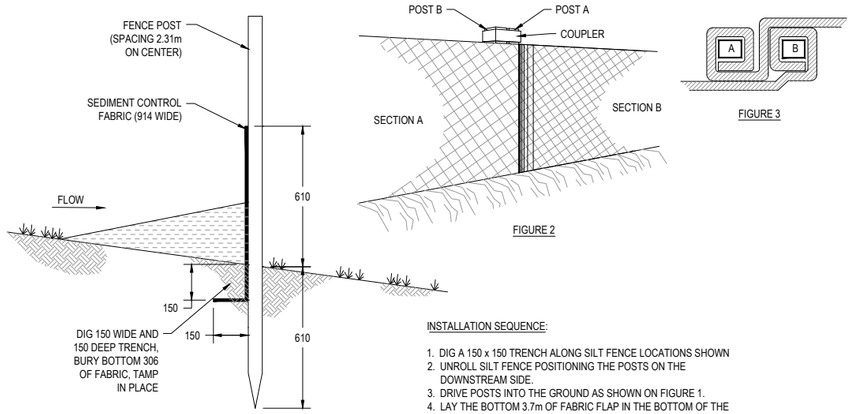


FIGURE 1

FIGURE 2

FIGURE 3

INSTALLATION SEQUENCE:

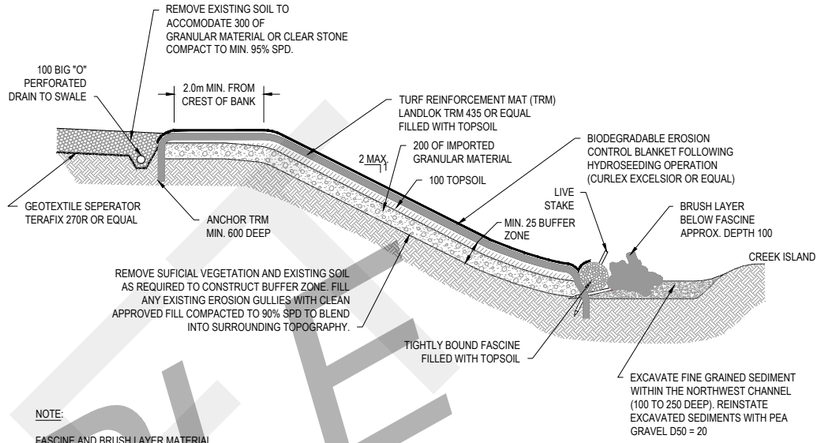
1. DIG A 150 x 150 TRENCH ALONG SILT FENCE LOCATIONS SHOWN
2. UNROLL SILT FENCE POSITIONING THE POSTS ON THE DOWNSTREAM SIDE.
3. DRIVE POSTS INTO THE GROUND AS SHOWN ON FIGURE 1.
4. LAY THE BOTTOM 3.7m OF FABRIC FLAP IN THE BOTTOM OF THE TRENCH, BACKFILL AND COMPACT.
5. ADJACENT SECTIONS OF THE SILT FENCE ARE JOINED AS SHOWN IN FIGURE 3. A COUPLER CAN BE USED TO SECURE ADJACENT POSTS AS SHOWN IN FIGURE 2.

NOTES:

1. SILT FENCE HEIGHT TO BE 600 ABOVE GROUND, CONSTRUCTED OF FABRIC WITH MINIMUM TENSILE STRENGTH OF 54.43 kg (MIRAFI ENVIROFENCE, TERRAFIX TERRAFENCE OR APPROVED EQUIVALENT).
2. SILT FENCE TO HAVE FACTORY ATTACHED FENCE POSTS.
3. REFER TO DRAWING FOR LOCATION OF SILT FENCE.

A SILT FENCE DETAILS

NTS

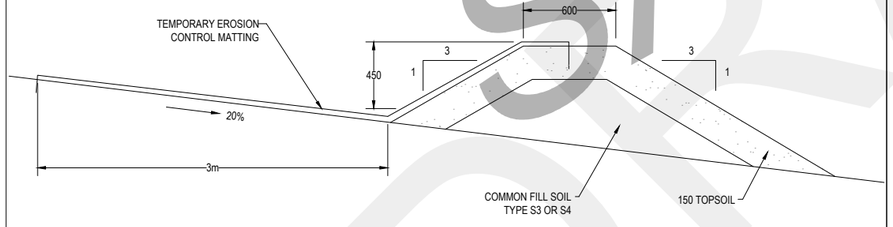


NOTE:

FASCINE AND BRUSH LAYER MATERIAL
TO BE YOUNG (LESS THAN 5 YEARS GROWTH)
CORNUS, SALIX-SPP., HARVESTED DURING
DORMANCY IF AVAILABLE.

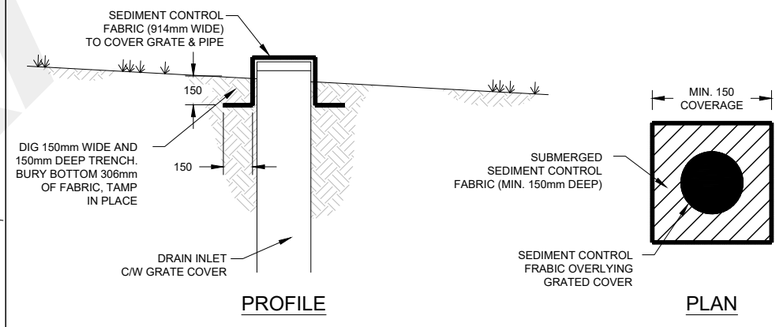
B BANK TREATMENT DETAIL

NTS



C DIVERSION BERM CROSS SECTION DETAIL

NTS



D DRAIN INLET WITH PROTECTION

NTS

SAMPLE
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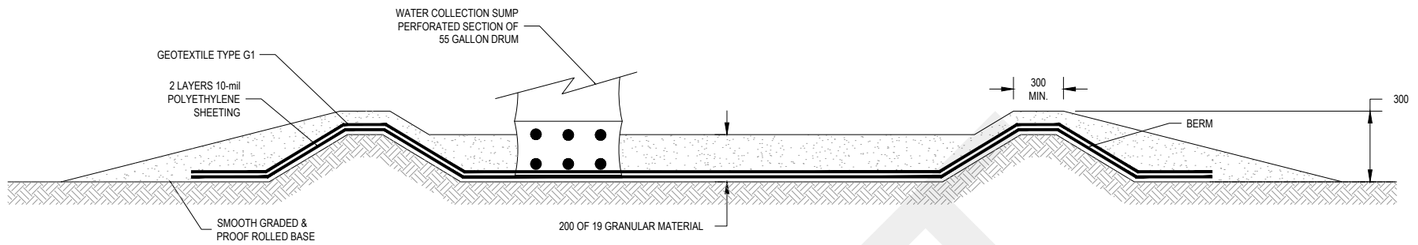
ENVIRONMENTAL PROTECTION PLAN
BOAT HARBOUR REMEDIATION

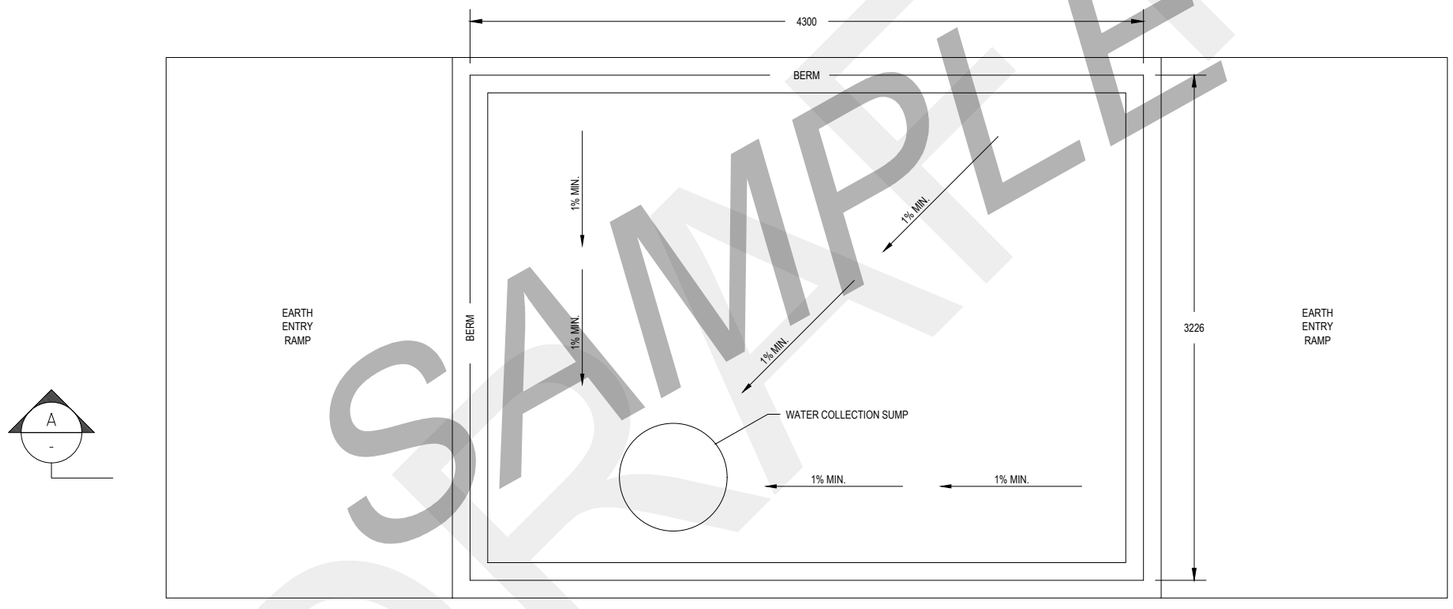
11148275
Sep 29, 2020

SAMPLE ENVIRONMENTAL CONTROL DETAILS

FIGURE 1



SECTION A
N.T.S.



NOTE:

1. TEMPORARY DECONTAMINATION PAD TO BE CONSTRUCTED IN SUITABLE LOCATION CLOSE TO WORK AREAS, AS REQUIRED.
2. TEMPORARY DECONTAMINATION PAD AND SEDIMENTS FROM DECONTAMINATING SSDA1 MATERIAL EXCAVATION EQUIPMENT TO BE BACKFILLED WITHIN CONTAINMENT CELL.

E TEMPORARY VEHICLE DECONTAMINATION PAD
NTS

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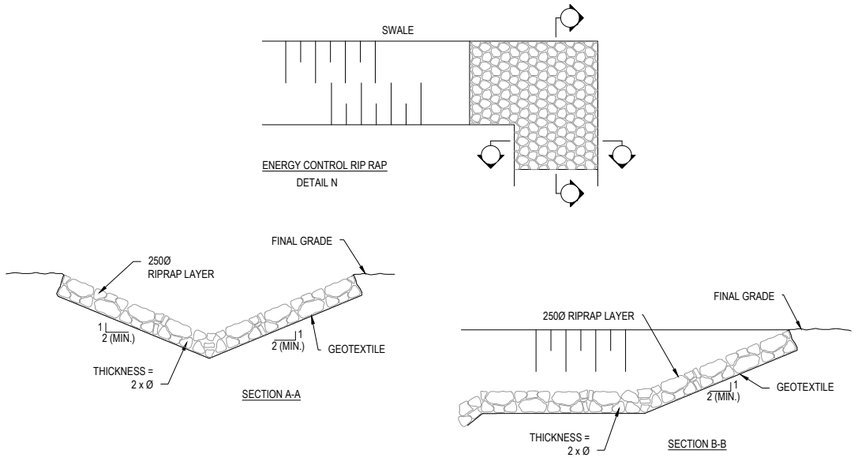
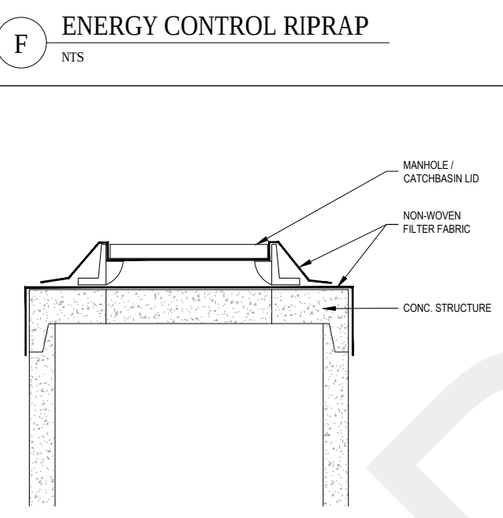
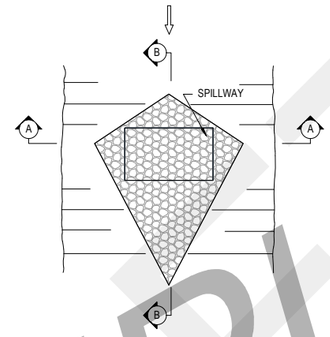
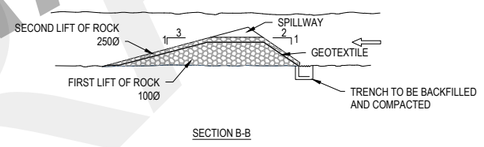


F ENERGY CONTROL RIPRAP
NTS

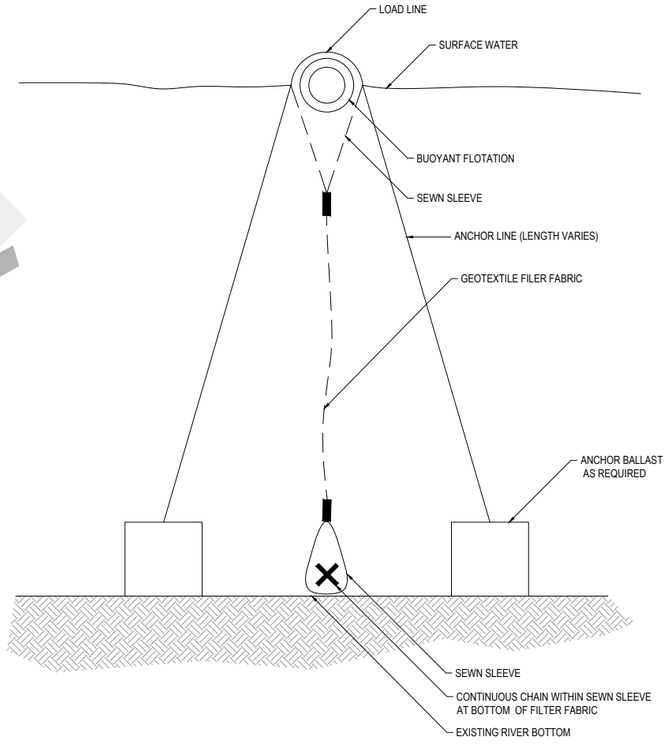


G MANHOLE/CATCHBASIN
TEMPORARY SILTATION PROTECTION
NTS





H ROCK CHECK DAM
NTS



I SILT FENCE AND SILT BOOM
NTS

SAMPLE
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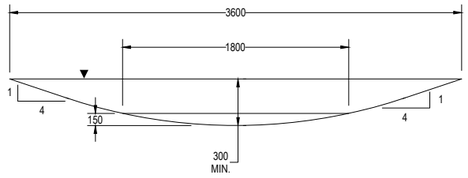
ENVIRONMENTAL PROTECTION PLAN
BOAT HARBOUR REMEDIATION

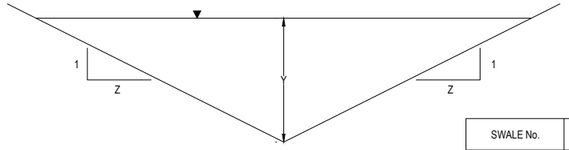
11148275
Sep 29, 2020

SAMPLE ENVIRONMENTAL CONTROL DETAILS

FIGURE 3

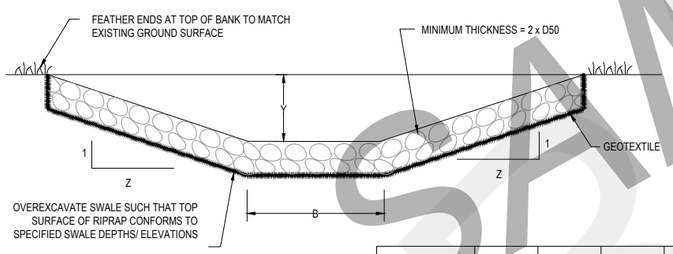


TYPE 5 - CAP



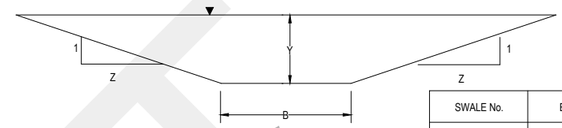
SWALE No.	Y	Z
	450	4
	450	4

TYPE 4 - "V"



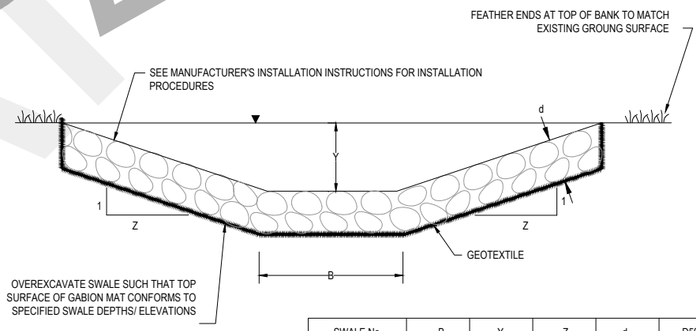
SWALE No.	B	Y	Z	D50
	900	300	3	150
	900	300	3	150
	900	300	3	150

TYPE 3 - TRAPEZOIDAL RIPRAP LINED



SWALE No.	B	Y	Z
	1800	450	3
	900	450	3

TYPE 2 - TRAPEZOIDAL GRASS LINED



SWALE No.	B	Y	Z	d	D50
4	900	300	3	300	125
6	900	300	3	300	125
7	900	300	3	300	125

TYPE 1 - TRAPEZOIDAL GABION MAT

J LINED SWALES

NTS

SAMPLE
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K OIL ABSORPTION BOOM
NTS

SAMPLE

CAD File: N:\CA\Ottawa\Legacy\CAD\8-chars\11------\1114----\111482--\11148275\11148275-REPORTS\11148275-18(033)\11148275-18(033)GN\11148275-18(033)GN-VA001.dwg

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Appendix C
Valued Component Mitigation Measures by Work Area

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Appendix C-1
Waste Management

C-1 Waste Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion	■		■		■														
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■														
Keep waste material contained through use enclosed dredging piping and geotubes	■		■		■														
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance					■														
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■														
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■														
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may be required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advance					■														
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■														
Burning of any material, including the disposal of combustible waste material will not be permitted					■														
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently removing sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges)					■														
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a dust suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared					■														
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a Site-Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issues					■														
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■														
All dust generating equipment will have functioning mounted dust collection devices					■														
Pave high traffic Site roads as noted on construction drawings in vicinity of receptors to reduce dust emissions	■																		
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval	■		■										■					■	
Ensure vehicles travel over mud-mats to remove impacted sediment soil at all times before leaving the Site; and as needed are cleaned at wheel wash station on-site	■																		
Minimize the drop heights for all equipment transferring soil/aggregate to reduce emissions of particulate matter	■																		
Use odour neutralizing foam in vicinity of odour source, as needed to reduce any potential odour impacts to sensitive receptors	■																		
Cap the containment cell (CC) after remediation is complete to reduce methane migration	■						■												
Minimize vehicle traffic and reduce trip length to limit emissions produced	■																		
Conduct operations in a way which limits the biological material that is placed in the CC to reduce long-term Landfill Gas (LFG) emissions. This will be done by limiting the amount of non-impacted vegetation placed in the CC							■												
Implement best management practices (BMPs), including passive venting to control LFGs release from the CC							■												
Final landfill cover contours have been designed to accommodate the anticipated range of final waste volumes and control the release of LFG							■												
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■	■					■				
Site designed to minimize the need for reversing and vehicle reversing alarms															■				
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■				
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■				
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■				
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■				
Procure equipment that meets or exceeds industry standards in terms of noise levels, and regular maintenance of the equipment will reduce noise levels			■												■				
Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment															■				
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly			■												■				
Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■				
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors surrounding the Site. Regular check by Contractor(s) EM for excessive noise on-site and in relation to sensitive receptors so that resolution can be timely.															■				
Design Site, including widening of roadways, the turn-around at CC and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms															■				
Contract agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■				
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors. Regular checks by Site manager for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely															■				
Implement the Compliant Procedure Protocol outlined in Section 10.2 of the Environmental Management Plan (EMP) prepared under separate cover								■		■									
Install, wherever possible, motion-sensor to ensure lights are not turned on when they are not necessary										■									
Only direct and focused light will be used for worker safety										■			■						
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■									

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C-1 Waste Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (post-curfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route.										■									
Include an obligation to comply with environmental protection including light reduction in Subcontractor agreements			■							■				■					
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■													
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■			■	■				■	■	■	■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■													
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■													
Grade area around the TLTF and leachate loading station such that any spills will be directed to the lined stormwater management pond						■		■											
Maintain the isolation valve on the stormwater pond outlet structure in a normally closed position during operation phase of the TLTF						■													
Monitor the TLTF operation regularly (daily during the week), and as part of normal operation, which would include a weekly walk-through of the physical system to check for leaks						■													
Design TLTF to have a secondary containment for all chemicals on-site as a spills management measure						■													
The effluent conveyance piping will be monitored weekly as specified in the Site-Specific Environmental Protection Plan (EPP) to ensure no releases occur						■													
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■											
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■											
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate off-site								■											
Plans to monitor and maintain leachate collection system within CC								■											
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■											
Geosynthetic clay liner (GCL) will be installed over the existing clay liner								■											
Flexible membrane liner (FML) and protective cover system consisting of a geotextile or sand installed over the GCL								■											
Leachate collection system consisting of leachate collection piping and an aggregate drainage layer overlaid with a geotextile over the entire CC footprint.								■											
Groundwater monitoring well network surrounding the perimeter of the CC to confirm performance of the base liner and leachate collection system								■											
Construct proposed liner system and leachate collection system within the CC								■											
Monitor perimeter groundwater wells for contaminants of concern (COCs) as monitored as part of the CMOC services.								■											
Construct a leachate holding tank with appropriate seals and construct spill containment in case of spill while pumping from the holding tank to tanker truck to haul leachate off-site								■											
Monitor and maintain leachate collection system within CC. The amount of leachate generated will be logged via Supervisory Control and Data Acquisition (SCADA) computer system and will be monitored for trends that would indicate changes to effectiveness of the leachate collection system, or failure of pumps								■											
Monitor weekly and maintain final cover system								■											
Automatically logging of leachate levels in the holding tank will be completed and tracked by computer system. The system has the ability to contact the Owner to demonstrate pre-set fill levels to allow for arrangement of hauling								■											
Minimize travel across areas of exposed soil to reduce compaction of the soil. Utilize pre-constructed temporary access points as indicated for equipment access.				■													■	■	■
Manage runoff through selecting discharge locations with well-established vegetation that are less susceptible to erosion and through planting native vegetation where required																		■	
The use of silt curtains to control sedimentation																	■		
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TSS) Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring program																	■		
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																	■		
Install the new stormwater management system to separate stormwater runoff and leachate, which will greatly improve the quality of the stormwater																	■		
Construction of channels to act as temporary storm ditches or diversion swales to convey stormwater runoff away from excavation areas on-site																	■		
Treat all stormwater that comes in contact with the waste as leachate																	■		
Direct stormwater runoff from CC while under interim and final cover to the forebay pond through a constructed channel, which will be rock lined to prevent erosion and reduce stormwater velocity																	■		
Construct the outlet pipe from the stormwater pond using High-Density Polyethylene (HDPE) pipe																	■		
Design stormwater management system to have the capacity to contain stormwater generated from a 100-year precipitation event without any flooding																	■		
Fully line the forebay and settling ponds with a heavy geotextile liner system. The ponds will have an additional lining of angular stones for approximately 6 inches (150 millimetre [mm])																	■		
Design ponds to accommodate stormwater generated from the 100-year precipitation event while maintaining a freeboard of 0.6 metres (m), which is twice the recommended freeboard of 0.3 m																	■		
Construct outlet flow control structure to reduce sedimentation																	■		
Maintain surface water flow regime outside the CC perimeter to preserve current conditions																	■		
Conduct refueling 30 m from nearest Boat Harbour Tributary																	■		

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C-1 Waste Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Continue to implement the sediment and erosion control measures and best management practices listed above for the site preparation and design stage, as appropriate																	■		
Manage construction and roadway runoff through natural vegetation and/or sediment controls such as a silt fence or bales.				■													■		■
Avoid the storage of hazardous material or equipment containing hazardous material overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps due to the increased risk of flood				■													■		■
Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.																		■	
To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■	
Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods				■														■	■
Implement all Erosion and Sediment Control (ESC) practices prior to any soil disturbing activities, where applicable including silt fencing, silt curtains, controlled access points, diversion swales, and mud mats, as per *Erosion and Sedimentation Handbook for Construction Sites* (Nova Scotia 1988)				■														■	
Complete erosion and sediment control planning to ensure Site runoff is not directed towards a partially impacted wetland or fish habitat				■														■	
Clean equipment that is brought to Site and inspect for cleanliness prior to commencing work to reduce the potential for introduction of non-native species																		■	
Maintenance of the sediment and erosion control measures in place prior to each new phase of the Project																		■	
Use straw crimped and or matted and seeded upon final abandonment in areas that have erosion potential to return the area to pre-disturbance conditions in a timely fashion																		■	
Implement a reclamation program for terrestrial areas within the Project footprint to re-establish native vegetation communities																		■	
Establish construction methods, such as working from up-gradient to down-gradient that reduce the potential to drain or flood a partially altered wetland or down-gradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road construction				■														■	
Implement wetland compensation plan (to be developed post General Contract)																			■
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Ensure wetland boundary flagging tape is in place prior to construction and remediation activities taking place											■								■
Stabilize and re-vegetate slopes to limit erosion and sedimentation into each adjacent wetland																			■
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions	■				■								■						■
Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to Nova Scotia Environment (NSE)											■								■
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is un-altered, and that sunlight does not influence water temperature more than currently																		■	■
Securely lock up all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) when not in use in the office yard to avoid vandalism and accidental spills				■													■		■
Transfer all deleterious substances (including fuel, cleaners, solvents, paint, etc.) at designated refuelling areas that are equipped to handle a potential spill to limit the release of deleterious substances to the surrounding environment				■													■		■
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■							■	■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■								
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■						
Wildlife awareness training will be provided to all Site personnel during Site-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poaching activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHETF)											■								
Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings											■								
Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on site											■								
Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contractor EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the site. The wildlife should not be approached or handled. The Contractor EM will contact Nova Scotia Lands Inc. (NSLI)											■								
A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wildlife observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will											■								
Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests are observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental											■								
Parking, laydown and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated											■								
Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers											■								
Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to be stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weather											■								
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■						
Limit clearing to approved alteration areas											■					■			
Set appropriate speed limit on-site to help reduce the probability of vehicular collisions, or collisions between vehicles and mammals and wildlife											■					■			
Provide wildlife awareness training to all Site personnel during Site-specific orientation. Wildlife awareness training will include measures to reduce interactions between Site personnel and wild species											■					■			
Store hazardous and non-hazardous waste in designated locations, in a dry location that is clean and well ventilated as appropriate to the material, including impermeable pads a minimum of 30 m from water or wetlands and handled in a manner which prevents release into the environmentin appropriate containers to reduce potential				■							■					■	■		■
Implement a wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF, this information can be used to install signage, if appropriate, in areas with high wildlife sightings											■					■			
Manage contaminated silt though the use of silt curtains, on-site drainage control, and proper storage of impacted materials																■			
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible													■						

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C-1 Waste Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■							
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■							
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.				■															■
Enforce Site-specific terms and conditions in the approval for all work associated with alterations in the Estuary and wetland alterations.				■															■
Ensure containment tray in place, and a portable spill kit will be on hand prior to any refuelling activities to ensure immediate containment of a spill				■													■		■
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curtains in conjunction with sedimentation additional measures such as a "moon pool" system												■							
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbicides shall be used near possible fish habitat				■								■							
ESC planning will be completed to ensure site run-off is not directed towards fish habitat				■															
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■															
Work should only commence following the installation of appropriate ESC measures as shown on the construction drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be functional				■															
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchoring. This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired location				■															
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ensure appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habitat				■															
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging, or other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functional				■															
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in good repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should				■															
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. No items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■															
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■															
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■															
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory bird breeding season where practical (April 15th to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC)												■				■			
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This will identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep event												■							
Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season												■				■			
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that will be submitted to NSE												■							
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new roads or laydowns without the Contract Administrators (CAs) approval												■							
Complete pre-construction meetings to ensure construction staff are aware of potential and confirme fish habitat on-site				■															
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■															
Adhere to wetland and watercourse alteration and general construction schedules				■															
Avoid fish habitat wherever possible during detailed project planning and design				■														■	
Minimize total Project footprint within the surface water system will be considered during planning to account for fish habitat area that could not be avoided				■															
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to request an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish habitat				■															
Compensate for permanent loss of aquatic habitat through habitat compensation activities, subject to DFO, based on the Fisheries Act current at time of the Project				■															
Place rip-rap around the discharge points to dissipate the energy and reduce erosion of native soil material				■															
Limit clearing within wetland and watercourse fish habitat outside of approved alteration areas				■														■	
Instruct and personnel to avoid entering any areas specifially including wetlands and watercourses outside of approved alteration areas with machinery				■							■					■			■
Cover large piles or patches of bare soil or un vegetated areas during the breeding season, wherever possible to discourage ground nesting or burrow nesting species (such as common nighthawk and bank swallows), large piles or patches of bare soil will not be left uncovered or un vegetated during the breeding season, wherever possible												■				■			
Should any ground or burrow nesting species initiate breeding activities on stockpiles or exposed areas, the Proponent will work with ECCC and NSE to develop buffer and non disturbance distances and zones that incorporate adaptive management should any ground or burrow nesting species initiate breeding activities on												■							
Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground or burrow nesting species initiate breeding activities on stockpiles or exposed areas																■			
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■		■							
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion				■							■					■	■	■	■
Avoid intact forest stands and wetlands will be avoided wherever possible during detailed Project planning and design in favor of previously disturbed areas (e.g., stands disturbed by timber harvesting, existing roads, or other development); especially those that are predominantly mature softwood, as several Species of Conservation																■			
Re-vegetate slope between the edge of project infrastructure, roads or stockpile locations, or ditch and adjacent wetlands will be re-vegetated to stabilize the slope and limit erosion and sedimentation into adjacent habitats																■		■	
Employ measures to reduce the spread of invasive species including cleaning and inspecting vehicles will be employed wherever possible to maintain the quality of remaining habitat											■					■			
Plan access to areas proposed for remediation in such a way that habitat fragmentation and clearing is minimized																■			
Upgrade existing roads wherever possible, instead of building new roads to reduce habitat fragmentation																■			

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C-1 Waste Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Maintain cleared areas along roadsides to improve visibility and reduce the potential for collisions with wildlife or pedestrians																■			
Conduct vegetation management by cutting (e.g., no use of herbicides)				■							■					■		■	■
Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird Species at Risk (SAR) and work with ECCC to prevent any future mortalities or injuries																■			
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries. A refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leakage													■				■	■	
Ensuring regulatory compliance in transporting Dangerous Goods			■						■					■					
Adequate driver training and training in accident or malfunction protocols														■					
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights									■					■					
Conduct long-term groundwater and surface water monitoring for the containment cell to confirm leakage is not occurring and to document water quality in relation to potable water supplies									■					■					
Ensure appropriate transport equipment/truck is used to transport leachate			■						■					■					
Provide adequate driver training and training in accident or malfunction protocols			■						■					■					
Implement traffic, noise, light, and air mitigation measures as described within other VCs outlined above														■					
Minimize the size/extent of open faces of the containment cell that have potential to emit odours or other contaminants			■						■										
Minimize vehicle traffic, including length of trips			■																
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation	■				■														
Ensure proper road signage									■										
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																	
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete operator training for identification of potential archaeological/cultural heritage resources		■																	
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																	
In the event that archaeological/cultural resources are encountered during waste management activities, all work will be halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and		■																	
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																	
Review Archaeological assessment reports for areas of avoidance		■																	
Complete additional shovel testing, as required, prior to ground disturbance in areas ascribed as high archaeological potential		■																	
Complete a Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete further research and shovel testing Study Area or design layout of the Project area change		■																	
Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities		■																	
Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'kw Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		■																	
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■				
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions									■										
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely									■						■				
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.											■								
Implement Complaint Procedure Protocol as described in the EMP prepared under separate cover			■												■				

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Appendix C-2
Dredging

C-2 Dredging

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion					■														
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■														
Keep waste material contained through use enclosed dredging piping and geotubes	■				■														
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance	■				■														
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■														
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■														
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advance					■														
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■														
Burning of any material, including the disposal of combustible waste material will not be permitted					■														
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently remov sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges) will					■														
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a d suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared to increase t					■														
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a S Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issue					■														
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■														
All dust generating equipment will have functioning mounted dust collection devices					■														
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval													■					■	
Where not contained by geotubes, dredged sediment will be properly covered with tarps and/or neutralizing foam to minimize the exposed area and the potential for odour emissions during transportation	■																		
Minimize the dry operation of dredged materials to limit the release of any contaminants or the creation of dust	■																		
Locate dredge piping cleanouts away from and out of proximity to sensitive receptors to limit any potential odour impacts	■																		
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■										
Site designed to minimize the need for reversing and vehicle reversing alarms															■				
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■				
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■				
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■				
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■				
Procure equipment that meets or exceeds industry standards in terms of noise levels, and regular maintenance of the equipment will reduce noise levels			■						■						■				
Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment															■				
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly			■						■						■				
Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■				
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors surround the Site. Regular check by Contractor(s) EM for excessive noise on site and in relation to sensitive receptors so that resolution can be timely			■												■				
Design Site, including widening of roadways, the turn-around at CC and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms			■												■				
Implement the Compliant Procedure Protocol outlined in Section 10.2 of the Environmental Management Plan (EMP) prepared under separate cover										■					■				
Install, wherever possible, motion sensor to ensure lights are not turned on when they are not necessary										■									
Only direct and focused light will be used for worker safety										■									
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■									
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (postcurfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route.										■									
Include an obligation to comply with environmental protection including light reduction in Subcontractor agreements										■				■					
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■													
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■			■	■					■	■	■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■													
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■													
Monitor dewatering effluent conveyance piping weekly as specified within Section 7.3.10 to ensure no releases occur.						■													
Monitor suspended solids concentration to ensure the use of silt curtains are performing and repair as needed.						■													

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C-2 Dredging

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Remove impacted sediments to meet risk-based sediment criteria specified in the QA/QC Program for dredging						■													
Install and maintain silt curtains between active dredging cell and adjacent cells and apply erosion and sediment control means (such as coir logs or bales), at stream entrances and access roads to dredging areas as needed						■													
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■											
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■											
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate off-site								■											
Plans to monitor and maintain leachate collection system within CC								■											
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■											
Monitor groundwater levels and quality as outlined in Section 7.4.3 and the Site-Specific Groundwater Monitoring Plan as implemented by the CMOC.								■											
Minimize travel across areas of exposed soil to reduce compaction of the soil. Utilize pre-constructed temporary access points as indicated for equipment access.				■												■	■	■	
The use of silt curtains to control sedimentation																■			
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring program																■			
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																■			
Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program.																■			
Manage construction and roadway runoff through natural vegetation and/or sediment controls such as a silt fence or bales.				■												■			
Conduct construction and major operations within wetlands and estuary outside critical periods for the protection of aquatic life as defined by DFO (spawning, migration, etc.) to avoid impacts to wildlife during sensitive life stages.																■			
Avoid the storage of hazardous material or equipment containing hazardous material overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps due to the increased risk of flood				■												■			
Develop and implement a refueling plan for approval by CMOC EM, as refueling will need to take place on or n water. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near wa																■		■	
Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.																		■	
To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■	
Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods				■														■	
Implement all Erosion and Sediment Control (ESC) practices prior to any soil disturbing activities, where applica including silt fencing, silt curtains, controlled access points, diversion swales, and mud mats, as p *Erosion and Sedimentation Handbook for Construction Sites* (Nova Scotia 1988)				■												■		■	
Complete erosion and sediment control planning to ensure Site runoff is not directed towards a partially impacted wetland or fish habitat				■															
Clean and inspect equipment that is brought to Site prior to commencing work to reduce the potential for introduction of non-native species																		■	
Establish construction methods, such as working from up-gradient to down-gradient that reduce the potential to drain flood a partially altered wetland or down-gradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road constructio				■															
Implement wetland compensation plan (to be developed post General Contract)																			■
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Ensure wetland boundary flagging tape is in place prior to construction and remediation activities taking place											■					■			
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions					■								■						■
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is unaltered, and that sunlight does not influence water temperature more than currently																			■
Securely lock up all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) when not in use in the office yard to avoid vandalism and accidental spills				■													■		
Transfer all deleterious substances (including fuel, cleaners, solvents, paint, etc.) at designated refuelling areas that are equipped to handle a potential spill to limit the release of deleterious substances to the surrounding environment				■													■		
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■							■	■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■								
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■						
Wildlife awareness training will be provided to all Site personnel during S-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poach activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHETF											■								
Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings											■								
Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on site											■								
Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contrac EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the site. The wildlife should not be approached or handled. The Contractor EM will contact Nova Scotia Lands Inc. (NSLI) (via the CMC											■								
A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wild observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will											■								
Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests a observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessme											■								
Parking, laydown and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated											■								
Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers											■								

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C-2 Dredging

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weath											■								
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■						
Limit clearing to approved alteration areas											■					■			
Set appropriate speed limit on-site to help reduce the probability of vehicular collisions, or collisions between vehicles and mammals and wildlife											■					■			
Provide wildlife awareness training to all Site personnel during Site-specific orientation. Wildlife awareness training will include measures to reduce interactions between Site personnel and wild species											■					■			
Store hazardous and non-hazardous waste in designated locations, in a dry location that is clean and well ventilated appropriate to the material, including impermeable pads a minimum of 30 m from water or wetlands and handled in a manner which prevents release into the environmentin appropriate containers to reduce potential for spills, and				■							■						■		
Implement a wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF, this information can be used to install signage, if appropriate, in areas with high wildlife sightings											■					■			
Manage contaminated silt though the use of silt curtains, on-site drainage control, and proper storage of impacted materials											■					■			
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible													■						
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■							
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■							
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.				■															■
Ensure containment tray in place, and a portable spill kit will be on hand prior to any refuelling activities to ensure immediate containment of a spill				■													■		
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curta in conjunction with sedimentation additional measures such as a "moon pool" system												■							
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbic shall be used near possible fish habitat				■								■							
ESC planning will be completed to ensure site run-off is not directed towards fish habitat				■															
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■															
Work should only commence following the installation of appropriate ESC measures as shown on the constructi drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be function				■															
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchori This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired locati				■															
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ens appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habitat				■															
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functio				■															
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in g repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate e				■															
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■															
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■															
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■															
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory b breeding season where practical (April 15 to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC) a													■			■			
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep ev													■						
Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season													■						
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that wil submitted to NSE													■						
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new road laydowns without the Contract Administrators (CAs) approval													■						
Complete pre-construction meetings to ensure construction staff are aware of potential and confirme fish habitat on-site				■															
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■															
Avoid fish habitat wherever possible during detailed project planning and design				■														■	
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to requ an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish hab				■															
Place rip-rap around the discharge points to dissipate the energy and reduce erosion of native soil material				■															
Limit clearing within wetland and watercourse fish habitat outside of approved alteration areas				■															
Euthanize fish in a culturally sensitive manner that will be determined in consultation with PLFN				■															
Where aquatic habitat can't be avoided, minimization of total Project footprint within the surface water system will be considered during planning				■															
Use of silt curtains to limit levels of TSS, Total Dissolved Solids (TDS), turbidity, and conductivity during remediation.				■															
Continue fish awareness and avoidance, sediment and erosion control and vegetation management measures during mechanical and hydraulic dredging that were established during site preparation and construction				■															
Instruct and personnel to avoid entering any areas specifially including wetlands and watercourses outside of appro alteration areas with machinery											■					■			
Cover large piles or patches of bare soil or un vegetated areas during the breeding season, wherever possibl discourage ground nesting or burrow nesting species (such as common nighthawk and bank swallows), large piles or patches of bare soil will not be left uncovered or un vegetated during the breeding season, wherever poss													■			■			

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C-2 Dredging

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Use only direct and focused light when needed for worker safety to limit the attraction and distortion of birds caused by the additional light on-site													■						
Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground or burrow nesting species initiate breeding activities on stockpiles or exposed areas													■			■			
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■			■						
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion				■							■					■	■	■	
Employ measures to reduce the spread of invasive species including cleaning and inspecting vehicles will be employed wherever possible to maintain the quality of remaining habitat											■					■			
Conduct vegetation management by cutting (e.g., no use of herbicides)				■							■					■		■	
Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird Species at Risk (SAR) and work with ECCC to prevent any future mortalities or injuries																■			
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leaka													■						
Ensuring regulatory compliance in transporting Dangerous Goods														■					
Adequate driver training and training in accident or malfunction protocols														■					
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights														■					
Implement traffic, noise, light, and air mitigation measures as described within other VCs outlined above														■					
Implement preventative maintenance plans for all mobile and stationary equipment			■						■										
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation	■				■														
Ensure proper road signage									■										
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																	
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete operator training for identification of potential archaeological/cultural heritage resources		■																	
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																	
In the event that archaeological/cultural resources are encountered during waste management activities, all work wil halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembl		■																	
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																	
Review Archaeological assessment reports for areas of avoidance		■																	
Complete additional shovel testing, as required, prior to ground disturbance in areas ascribed as high archaeological potential		■																	
Complete a Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete further research and shovel testing Study Area or design layout of the Project area change		■																	
Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities		■																	
Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		■																	
Complete archaeological monitoring during any ground disturbance within the historic limits of Boat Harbour and its associated marshes		■																	
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■				
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions			■						■										
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely									■						■				
Stockpile areas and infrastructure will be located in the central portions of the Site, further from sensitive recepti surrounding the Site Regular check by site manager for excessive noise on-site and in relation to sensitive receptors s that resolution can be timel									■										
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.											■								
Implement Complaint Procedure Protocol as described in the EMP prepared under separate cover															■				

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Appendix C-3
Wetland Management

C-3 Wetland Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion					■													
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■													
Keep waste material contained through use enclosed dredging piping and geotubes	■				■													
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance					■													
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■													
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■													
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advance					■													
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■													
Burning of any material, including the disposal of combustible waste material will not be permitted					■													
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently remov sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges) will					■													
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a d suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared to increase t					■													
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a S Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issue					■													
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■													
All dust generating equipment will have functioning mounted dust collection devices					■													
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval	■		■						■				■					■
Ensure vehicles travel over mud-mats to remove impacted sediment soil at all times before leaving the Site; and as needed are cleaned at wheel wash station on-site														■				
Cover all stockpiles of dredged sediment to reduce emissions of contaminants and odour	■		■						■									
Minimize vehicle traffic and reduce trip length to limit emissions produced	■																	
Minimize the dry operation of dredged materials to limit the release of any contaminants or the creation of dust	■		■						■									
Transfer the dredged material in positions near the access roads to limit the amount of travel of all heavy equipment	■		■						■									
Locate dredge piping cleanouts away from and out of proximity to sensitive receptors to limit any potential odour impacts	■																	
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■									
Site designed to minimize the need for reversing and vehicle reversing alarms															■			
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■			
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■			
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■			
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■			
Procure equipment that meets or exceeds industry standards in terms of noise levels, and regular maintenance of the equipment will reduce noise levels			■						■						■			
Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment															■			
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly			■						■						■			
Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■			
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors surround the Site. Regular check by Contractor(s) EM for excessive noise on-site and in relation to sensitive receptors so that resolution can be timely															■			
Design Site, including widening of roadways, the turn-around at CC and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms															■			
Implement the Compliant Procedure Protocol outlined in Section 10.2 of the Environmental Management Plan (EMP) prepared under separate cover															■			
Install, wherever possible, motion-sensor to ensure lights are not turned on when they are not necessary										■			■					
Only direct and focused light will be used for worker safety										■								
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■								
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (post-curfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route.										■								
Include an obligation to comply with environmental protection including light reduction in Subcontractor agreements														■				
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■												
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■				■					■	■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■												

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C-3 Wetland Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■												
Remove impacted sediments to meet risk-based sediment criteria specified in the QA/QC Program for dredging						■												
Monitor effluent conveyance piping weekly as specified in Section 7.3.10 to ensure no releases occur						■												
Install and maintain silt curtains between active dredging cell and adjacent cells and apply erosion and sediment control means (such as coir logs or bales), at stream entrances and access roads to dredging areas as needed						■												
Monitor suspended solids concentration to ensure silt curtains are performing and repair as needed						■												
Minimize handling of impacted sludge/sediment being removed from wetlands						■												
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■										
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■										
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate off-site								■										
Plans to monitor and maintain leachate collection system within CC								■										
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■										
Use clean imported material for construction of access roads								■										
Monitor groundwater levels and quality as outlined in 7.4.3 and the Site-Specific EPP-Groundwater Monitoring Plan prepared by the Contractor(s)								■										
Monitor groundwater levels and quality during dredging as outlined in Section 7.3.9 and the Site-Specific EPP-Groundwater Monitoring Plan prepared by the Contractor								■										
Minimize travel across areas of exposed soil to reduce compaction of the soil. Utilize pre-constructed temporary access points as indicated for equipment access.				■								■						■
The use of silt curtains to control sedimentation																	■	
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring program																	■	
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																	■	
Manage construction and roadway runoff through natural vegetation and/or sediment controls such as a silt fence or bales.				■								■					■	
Utilize cofferdam and bypass pumping approach around dam work area to provide more secure controls in tidally influence area.											■	■					■	
Control effluent discharge to estuary at the outlet control structure to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program																	■	
Conduct construction and major operations within wetlands and estuary outside critical periods for the protection of aquatic life as defined by DFO (spawning, migration, etc.) to avoid impacts to wildlife during sensitive life stages.																	■	
Avoid the storage of hazardous material or equipment containing hazardous material overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps due to the increased risk of flood				■								■					■	
Develop and implement a refueling plan for approval by CMOC EM, as refueling will need to take place on or n water. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near wa																	■	
Confirm background TSS in the estuary before beginning remediation work to use as a baseline to compare the results from the TSS monitoring that will be completed during remediation																	■	
Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.																		■
To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■
Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods				■														■
Implement all Erosion and Sediment Control (ESC) practices prior to any soil disturbing activities, where applica including silt fencing, silt curtains, controlled access points, diversion swales, and mud mats, as per *Erosion and Sedimentation Handbook for Construction Sites* (Nova Scotia 1988)				■							■					■	■	■
Complete erosion and sediment control planning to ensure Site runoff is not directed towards a partially impacted wetland or fish habitat				■								■						
Clean and inspect equipment that is brought to Site prior to commencing work to reduce the potential for introduction of non-native species																		■
Establish construction methods, such as working from up-gradient to down-gradient that reduce the potential to drain flood a partially altered wetland or down-gradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road constructio				■														■
Limit driving and use of machinery within wetland habitat where practical with use of swamp mats/corduroy bridges in wet areas to prevent rutting, diverting water flow, and sedimentation																		
Implement wetland compensation plan (to be developed post General Contract)																		
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																		
Ensure wetland boundary flagging tape is in place prior to construction and remediation activities taking place											■					■		
Stabilize and re-vegetate slopes to limit erosion and sedimentation into each adjacent wetland				■								■						
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions	■				■							■						
Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to Nova Scotia Environment (NSE)											■					■		
Complete remediation activities within wetlands outside the known breeding bird window where possible, or nes surveys shall be completed prior to commencing remediation based on Project approval terms defined by ECC and Nova Scotia Environment (NSE																		
Use appropriate erosion and siltation control measures during the remediation of impacted wetlands including the silt curtains between all active dredging cells and adjacent cells in the wetland and use of a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjac																		
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is not altered, and that sunlight does not influence water temperature more than currently				■							■	■						

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C-3 Wetland Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation
Securely lock up all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) when not in use in the office yard to avoid vandalism and accidental spills				■								■						
Transfer all deleterious substances (including fuel, cleaners, solvents, paint, etc.) at designated refuelling areas that are equipped to handle a potential spill to limit the release of deleterious substances to the surrounding environment				■								■					■	
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■					■		■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■		■					
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■					
Wildlife awareness training will be provided to all Site personnel during S-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poach activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHETF											■							
Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings											■							
Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on site											■							
Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contrac EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the site. The wildlife should not be approached or handled. The Contractor EM will contact Nova Scotia Lands Inc. (NSLI) (via the CMC											■							
A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wild observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will											■							
Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests a observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessme											■							
Parking, laydown and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated											■							
Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers											■							
Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weath											■							
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■					
Set appropriate speed limit on-site to help reduce the probability of vehicular collisions, or collisions between vehicles and mammals and wildlife											■					■		
Provide wildlife awareness training to all Site personnel during Site-specific orientation. Wildlife awareness training will include measures to reduce interactions between Site personnel and wild species											■					■		
Store hazardous and non-hazardous waste in designated locations, in a dry location that is clean and well ventilated appropriate to the material, including impermeable pads a minimum of 30 m from water or wetlands and handled in a manner which prevents release into the environmentin appropriate containers to reduce potential for spills, and				■							■	■				■	■	
Manage contaminated silt though the use of silt curtains, on-site drainage control, and proper storage of impacted materials											■					■		
Continue wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF, this information can be used to install signage, if appropriate, in areas with high wildlife sightings											■							
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible													■					
Identify natural channel s running through estuary and wetlands prior to remediation to protect the integrity of hydrology in the wetland.											■	■						
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■						
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■						
Complete pre-construction Site meetings with relevant construction staff to educate staff on policies related to working around the estuary												■						
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.				■								■						
Enforce Site-specific terms and conditions in the approval for all work associated with alterations in the Estuary and wetland alterations.				■								■						
Use a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas .											■	■					■	
Limit heavy machinery usage in the estuary												■						
Use barge/floating equipment wherever possible to limit driving and use of machinery within the estuary. Where practical swamp mats/corduroy bridges in wet areas will be used to prevent rutting, diverting water flow, and sedimentation												■						
Ensure containment tray in place, and a portable spill kit will be on hand prior to any refuelling activities to ensure immediate containment of a spill				■								■					■	
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curta in conjunction with sedimentation additional measures such as a "moon pool" system												■						
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbic shall be used near possible fish habitat				■								■						
ESC planning will be completed to ensure site runoff is not directed towards fish habitat				■														
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■														
Work should only commence following the installation of appropriate ESC measures as shown on the constructi drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be function				■														
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchorii This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired locati				■														
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ens appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habitat				■														
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functio				■														
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in g repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate e				■														
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■														
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■														

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C-3 Wetland Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■														
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory b breeding season where practical (April 15 to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC) ar													■			■		
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep ev													■					
Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season													■					
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that wi submitted to NSE													■					
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new road laydowns without the Contract Administrators (CAs) approval													■					
Complete pre-construction meetings to ensure construction staff are aware of potential and confirme fish habitat-site				■														
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■														
Adhere to wetland and watercourse alteration and general construction schedules				■														
Avoid fish habitat wherever possible during detailed project planning and design				■														■
Minimize total Project footprint within the surface water system will be considered during planning to account for fish habitat area that could not be avoided				■														
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to requ an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish hab				■														
Compensate for permanent loss of aquatic habitat through habitat compensation activities, subject to DFO, based on the Fisheries Act current at time of the Project				■														
Place rip-rap around the discharge points to dissipate the energy and reduce erosion of native soil material				■														
Limit clearing within wetland and watercourse fish habitat outside of approved alteration areas				■														■
Euthanize fish in a culturally sensitive manner that will be determined in consultation with PLFN												■						
Continue fish awareness and avoidance, sediment and erosion control and vegetation management measures during mechanical and hydraulic dredging that were established during site preparation and construction				■														
Work with DFO to determine treatment and protocols related to any fish currently inhabiting Boat Harbour and wetlands				■														
Continue ESC measures implemented during site preparation and construction				■														
Instruct and personnel to avoid entering any areas specifially including wetlands and watercourses outside of appro alteration areas with machinery				■							■					■		
Cover large piles or patches of bare soil or un vegetated areas during the breeding season, wherever possibl discourage ground nesting or burrow nesting species (such as common nighthawk and bank swallows), large piles or patches of bare soil will not be left uncovered or un vegetated during the breeding season, wherever poss													■			■		
Use only direct and focused light when needed for worker safety to limit the attraction and distortion of birds caused by the additional light on-site													■					
Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground or burrow nesting species initiate breeding activities on stockpiles or exposed areas													■			■		
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■			■					
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion				■							■	■				■	■	■
Re-vegetate slope between the edge of project infrastructure, roads or stockpile locations, or ditch and adjacent wetlands will be revegetated to stabilize the slope and limit erosion and sedimentation into adjacent habitats																		■
Employ measures to reduce the spread of invasive species including cleaning and inspecting vehicles will be employed wherever possible to maintain the quality of remaining habitat											■					■		
Conduct vegetation management by cutting (e.g., no use of herbicides)				■							■	■				■		■
Continue wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings																■		
Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird Species at Risk (SAR) and work with ECCC to prevent any future mortalities or injuries																■		
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leaka													■				■	
Ensuring regulatory compliance in transporting Dangerous Goods														■				
Adequate driver training and training in accident or malfunction protocols														■				
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights														■				
Implement traffic, noise, light, and air mitigation measures as described within other VCs outlined above														■				
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation					■													
Ensure proper road signage									■									
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																
Complete operator training for identification of potential archaeological/cultural heritage resources		■																
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																
In the event that archaeological/cultural resources are encountered during waste management activities, all work wil halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assemb		■																

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C-3 Wetland Management

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																
Review Archaeological assessment reports for areas of avoidance		■																
Complete additional shovel testing, as required, prior to ground disturbance in areas ascribed as high archaeological potential		■																
Complete a Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																
Complete further research and shovel testing Study Area or design layout of the Project area change		■																
Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities		■																
Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu'Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		■																
Complete archaeological monitoring during any ground disturbance within the historic limits of Boat Harbour and its associated marshes		■																
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■			
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions									■									
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely									■						■			
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.											■							

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Appendix C-4
Bridge at Highway 348

C-4 Bridge at Highway 348

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion					■														
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■														
Keep waste material contained through use enclosed dredging piping and geotubes					■														
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance					■														
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■														
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■														
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advanc					■														
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■														
Burning of any material, including the disposal of combustible waste material will not be permitted					■														
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently remov sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges) will					■			■											
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a d suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared to increase t					■														
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a S Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issue					■														
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■														
All dust generating equipment will have functioning mounted dust collection devices					■														
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval	■		■								■		■			■		■	
Limiting the general particle size of bridge material from demolition activities to reduce the likelihood of particles becoming airborne	■																		
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■						■				
Site designed to minimize the need for reversing and vehicle reversing alarms															■				
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■				
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■				
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■				
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■				
Procure equipment that meets or exceeds industry standards in terms of noise levels, and regular maintenance of the equipment will reduce noise levels			■												■				
Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment															■				
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly			■												■				
Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■				
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors surround the Site. Regular check by Contractor(s) EM for excessive noise on site and in relation to sensitive receptors so that resolution can be timely															■				
Design Site, including widening of roadways, the turn-around at CC and placement of Site infrastructure to minimize the need for reversing and vehicle reversing alarms															■				
Implement the Compliant Procedure Protocol outlined in Section 10.2 of the Environmental Management Plan (EMP) prepared under separate cover															■				
Install, wherever possible, motion sensor to ensure lights are not turned on when they are not necessary										■			■			■			
Only direct and focused light will be used for worker safety										■									
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■									
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (postcurfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route										■									
Include an obligation to comply with environmental protection including light reduction in Subcontractor agreements			■											■					
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■													
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■				■					■	■	■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■													
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■													
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■											
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■											
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate off Site								■											
Plans to monitor and maintain leachate collection system within CC								■											

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C-4 Bridge at Highway 348

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■											
Implement erosion controls for the removal of portion of the on-land pipeline, which would include silt fence on the d gradient sides of the excavation location and any stockpiles and truck cleaning prior to departure to prevent migratio impacted materia								■											
Minimize travel across areas of exposed soil to reduce compaction of the soil. Utilize pre-constructed temporary acc points as indicated for equipment access.				■				■									■		
Manage runoff through selecting discharge locations with well-established vegetation that are less susceptible to erosion and through planting native vegetation where required								■											
The use of silt curtains to control sedimentation																	■		
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring progra																	■		
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																	■		
Manage construction and roadway runoff through natural vegetation and/or sediment controls such as a silt fence or bales.				■													■		
Implement additional sediment controls as needed to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program																	■		
Avoid the storage of hazardous material or equipment containing hazardous material overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps due to the increased risk of flood				■													■		
Develop and implement a refueling plan for approval by CMOC EM, as refueling will need to take place on or n water. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near wa																	■		
Inspect effluent pipeline for damage and residual contaminated material after cleaning and before cutting and cappin re-clean as needed								■											
Confirm background TSS in the estuary before beginning remediation work to use as a baseline to compare the results from the TSS monitoring that will be completed during remediation																	■		
Maintaining existing vegetation cover is the best and most cos effective erosion control practice.																		■	
To reduce the potential for introduction of non native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■	
Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods				■														■	
Implement all Erosion and Sediment Control (ESC) practices prior to any soil disturbing activities, where applica including silt fencing, silt curtains, controlled access points, diversion swales, and mud mats, as p *Erosion and Sedimentation Handbook for Construction Sites* (Nova Scotia 1988)				■		■												■	
Complete erosion and sediment control planning to ensure Site runoff is not directed towards a partially impacted wetland or fish habitat				■															
Clean and inspect equipment that is brought to Site prior to commencing work to reduce the potential for introductio of non-native species																		■	
Establish construction methods, such as working from up-gradient to down-gradient that reduce the potential to drai flood a partially altered wetland or down-gradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road constructio				■															
Implement wetland compensation plan (to be developed post General Contract)																			■
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions					■														
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is not altered, and that sunlight does not influence water temperature more than currently																			■
Securely lock up all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) when not i use in the office yard to avoid vandalism and accidental spills				■													■		
Transfer all deleterious substances (including fuel, cleaners, solvents, paint, etc.) at designated refuelling areas that are equipped to handle a potential spill to limit the release of deleterious substances to the surrounding environment				■													■		
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■							■	■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■		■			■			
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■						
Wildlife awareness training will be provided to all Site personnel during S specific orientation, wildlife awarenes training will include measures to reduce interactions between Site personnel and wild species and reporting of poach activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHET											■								
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Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessme											■								
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Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weath											■								
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■						
Limit clearing to approved alteration areas											■								
Set appropriate speed limit on-site to help reduce the probability of vehicular collisions, or collisions between vehicles and mammals and wildlife											■								
Provide wildlife awareness training to all Site personnel during Site specific orientation. Wildlife awareness training will include measures to reduce interactions between Site personnel and wild species											■								

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C-4 Bridge at Highway 348

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Store hazardous and nor-hazardous waste in designated locations, in a dry location that is clean and well ventilated appropriate to the material, including impermeable pads a minimum of 30 m from water or wetlands and handled in a manner which prevents release into the environmentin appropriate containers to reduce potential for spills, and				■							■						■		
Manage contaminated silt though the use of silt curtains, onsite drainage control, and proper storage of impacted materials											■								
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible											■		■			■			
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■							
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■							
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.																			■
Ensure containment tray in place, and a portable spill kit will be on hand prior to any refuelling activities to ensure immediate containment of a spill				■													■		
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curta in conjunction with sedimentation additional measures such as a "moon pool" system												■							
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbici shall be used near possible fish habitat				■								■							
ESC planning will be completed to ensure site runoff is not directed towards fish habitat				■															
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■															
Work should only commence following the installation of appropriate ESC measures as shown on the constructi drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be function				■															
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchorii This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired locati				■															
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ens appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habitat				■															
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functio				■															
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in g repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate e				■															
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■															
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■															
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■															
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory b breeding season where practical (April 15 to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC) ar													■						
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep ev													■						
Routes for machinery are to be shown on a figure, and then groundtruthed and corridors are to be surveyed for nesting birds during nesting season													■						
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that will submitted to NSE													■						
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new roads laydowns without the Contract Administrators (CAs) approval													■						
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■															
Avoid fish habitat wherever possible during detailed project planning and design				■														■	
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to requ an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish hab				■															
Place rip-rap around the discharge points to dissipate the energy and reduce erosion of native soil material				■															
Construction crews to adhere to wetland and watercourse alteration and general construction schedules				■															
Instruct and personnel to avoid entering any areas specifially including wetlands and watercourses outside of appro alteration areas with machinery				■							■								
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■	■		■			■			
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion				■				■			■						■	■	
Employ measures to reduce the spread of invasive species including cleaning and inspecting vehicles will be employed wherever possible to maintain the quality of remaining habitat											■								
Conduct vegetation management by cutting (e.g., no use of herbicides)				■							■							■	
Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird Species at Risk (SAR) and work with ECCC to prevent any future mortalities or injuries																■			
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leaka											■		■			■	■		
Ensuring regulatory compliance in transporting Dangerous Goods														■					
Adequate driver training and training in accident or malfunction protocols														■					
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights														■					
Implement traffic, noise, light, and air mitigation measures as described within other VCs outlined above														■					
Implement preventative maintenance plans for all mobile and stationary equipment			■																
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation	■		■		■														

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C-4 Bridge at Highway 348

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Reduce vehicle traffic volume and speed limit for the temporary causeway to reduce the amount of airborne emissio Volume and speed limits will be adjusted appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flo			■																
Reduce pile sizes during any demolition activity to limit the amount of dust emissions from stockpile wind erosion	■		■						■										
Limit the general particle size of bridge material from demolition activities to reduce the likelihood of particles becoming airborne			■						■										
Ensure proper road signage									■										
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																	
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete operator training for identification of potential archaeological/cultural heritage resources		■																	
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																	
In the event that archaeological/cultural resources are encountered during waste management activities, all work wil halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembl		■																	
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																	
Review Archaeological assessment reports for areas of avoidance		■																	
Complete additional shovel testing, as required, prior to ground disturbance in areas ascribed as high archaeologica potential		■																	
Complete a Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete further research and shovel testing Study Area or design layout of the Project area change		■																	
Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities		■																	
Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		■																	
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■				
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions									■										
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely									■						■				
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.									■		■								
Design and implement sidewalk with appropriate lighting on either side of the bridge will assist with safety (pedestrian and vehicles)									■										
Ensure adequate road signage									■										

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Appendix C-5
Pipeline Decommissioning

C-5 Pipeline Decommissioning

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion					■														
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■														
Keep waste material contained through use enclosed dredging piping and geotubes					■														
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance					■														
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■														
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■														
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advanc					■														
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■														
Burning of any material, including the disposal of combustible waste material will not be permitted					■														
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently remov sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges) will					■														
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a d suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared to increase t					■														
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a S Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issue					■														
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■														
All dust generating equipment will have functioning mounted dust collection devices					■														
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval											■		■					■	
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■						■				
Site designed to minimize the need for reversing and vehicle reversing alarms															■				
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■				
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■				
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■				
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■				
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly															■				
Install, wherever possible, motion sensor to ensure lights are not turned on when they are not necessary										■									
Only direct and focused light will be used for worker safety										■									
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■									
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (postcurfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route										■									
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■													
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■				■				■	■	■	■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■													
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■													
As needed, clean pipeline to remove loose sediment and effluent prior to removal						■													
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■											
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■											
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate offsite								■											
Plans to monitor and maintain leachate collection system within CC								■											
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■											
The use of silt curtains to control sedimentation																	■		
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring program																	■		
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																	■		
Inspect effluent pipeline for damage and residual contaminated material after cleaning and before cutting and capping, re-clean as needed																	■		
Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.																		■	
To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■	

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C-5 Pipeline Decommissioning

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods																		■	
Implement all Erosion and Sediment Control (ESC) practices prior to any soil disturbing activities, where applica including silt fencing, silt curtains, controlled access points, diversion swales, and mud mats, as pe *Erosion and Sedimentation Handbook for Construction Sites* (Nova Scotia 1988)																		■	
Clean and inspect equipment that is brought to Site prior to commencing work to reduce the potential for introduction of non-native species																		■	
Implement wetland compensation plan (to be developed post General Contract)																			■
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions					■														
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is not altered, and that sunlight does not influence water temperature more than currently																			■
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■							■	■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■								
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■						
Wildlife awareness training will be provided to all Site personnel during S-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poach activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHETF											■								
Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings											■								
Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on site											■								
Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contrac EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the site. The wildlife should not be approached or handled. The Contractor EM will contact Nova Scotia Lands Inc. (NSLI) (via the CMC											■								
A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wild observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will											■								
Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests a observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessme											■								
Parking, laydown and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated											■								
Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers											■								
Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weath											■								
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■						
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible											■		■						
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■							
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■							
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.																			■
Conduct visual surveys of the pipeline using remote sensing video cameras which will traverse the pipeline in its entirety to ensure adequate removal of material has been realized, and that no leaks or damage to the pipe is apparent												■				■			
Monitoring and Site supervision will take place during the cleaning and decommissioning of the underwater effluen pipeline which connects the pulp mill in Abercrombie to the BHETF, this will encompass best practices as they associate with the loading and transportation of contaminated materia												■				■			
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curta in conjunction with sedimentation additional measures such as a "moon pool" system												■							
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbic shall be used near possible fish habitat				■								■							
ESC planning will be completed to ensure site runoff is not directed towards fish habitat				■															
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■															
Work should only commence following the installation of appropriate ESC measures as shown on the constructi drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be function				■															
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchori This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired locati				■															
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ens appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habita				■															
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functio				■															
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in g repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate e				■															
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■															
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■															
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■															
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory b breeding season where practical (April 15 to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC) a													■						
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep ev													■						
Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season													■						
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that wil submitted to NSE													■						

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C-5 Pipeline Decommissioning

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new roads laydowns without the Contract Administrators (CAs) approval													■						
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■															
Avoid fish habitat wherever possible during detailed project planning and design																		■	
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to requ an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish hab				■															
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■			■						
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion											■		■				■	■	
Conduct vegetation management by cutting (e.g., no use of herbicides)											■							■	
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leaka											■								
Ensuring regulatory compliance in transporting Dangerous Goods														■					
Adequate driver training and training in accident or malfunction protocols														■					
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights														■					
Implement traffic, noise, light, and air mitigation measures as described within other VCs outlined above														■					
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation					■												■		
Ensure proper road signage			■						■										
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																	
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete operator training for identification of potential archaeological/cultural heritage resources		■																	
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																	
In the event that archaeological/cultural resources are encountered during waste management activities, all work wil halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembl		■																	
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																	
Review Archaeological assessment reports for areas of avoidance		■																	
Complete additional shovel testing, as required, prior to ground disturbance in areas ascribed as high archaeological potential		■																	
Complete a Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete further research and shovel testing Study Area or design layout of the Project area change		■																	
Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities		■																	
Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		■																	
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■				
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions									■										
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely									■						■				
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.											■								

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Appendix C-6
Treatment Buildings

C-6 Treatment Buildings

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion					■														
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■														
Keep waste material contained through use enclosed dredging piping and geotubes					■														
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance					■														
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■														
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■														
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advance					■														
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■														
Burning of any material, including the disposal of combustible waste material will not be permitted					■														
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently remov sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges) will					■														
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a d suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared to increase t					■														
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a S Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issue					■														
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■														
All dust generating equipment will have functioning mounted dust collection devices					■														
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval													■			■			
Provide a copy of the Hazardous Materials Survey (WSP, 2018) report to contractor who will undertake the future demolition work for the buildings investigated as part of this assessment	■																		
Require that contractors follow procedures to minimize the generation of dust which may contain asbestos, lead or other hazardous substances	■																		
Retain qualified contractors to remove and dispose of lead material as per the applicable acts, regulations and codes of practice	■																		
Wet building materials to reduce airborne concentrations of particulate matter	■																		
Limit the size of the stockpiles onsite to reduce the amount of particulate being emitted due to wind erosion and/or cover stockpiles, where applicable	■																		
Place hazardous material into appropriate secure disposal containers	■																		
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■						■				
Site designed to minimize the need for reversing and vehicle reversing alarms															■				
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■				
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■				
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■				
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■				
Procure equipment that meets or exceeds industry standards in terms of noise levels, and regular maintenance of the equipment will reduce noise levels															■				
Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment															■				
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly															■				
Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■				
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors surround the Site. Regular check by Contractor(s) EM for excessive noise onsite and in relation to sensitive receptors so that resolution can be timely															■				
Implement the Compliant Procedure Protocol outlined in Section 10.2 of the Environmental Management Plan (EMP) prepared under separate cover															■				
Install, wherever possible, motionsensor to ensure lights are not turned on when they are not necessary										■									
Only direct and focused light will be used for worker safety										■									
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■									
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (postcurfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route										■									
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■													
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■				■					■		■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■													
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■													
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■											

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C-6 Treatment Buildings

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■											
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate offsite								■											
Plans to monitor and maintain leachate collection system within CC								■											
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■											
The use of silt curtains to control sedimentation																	■		
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring prograr																	■		
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																	■		
Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.																		■	
To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■	
Implement wetland compensation plan (to be developed post General Contract)																			■
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions					■								■			■			
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is unaltered, and that sunlight does not influence water temperature more than currently																			■
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■							■	■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■								
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■						
Wildlife awareness training will be provided to all Site personnel during Site-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poach activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHETI											■								
Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings											■								
Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on site											■								
Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contrac EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the site. The wildlife should not be approached or handled. The Contractor EM will contact Nova Scotia Lands Inc. (NSLI) (via the CMC											■								
A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wild observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will											■								
Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests a observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessme											■								
Parking, laydown and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated											■								
Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers											■								
Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weath											■								
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■						
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible													■			■			
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■							
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■							
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.																			■
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curta in conjunction with sedimentation additional measures such as a "moon pool" system												■							
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbic shall be used near possible fish habitat				■								■							
ESC planning will be completed to ensure site runoff is not directed towards fish habitat				■															
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■															
Work should only commence following the installation of appropriate ESC measures as shown on the constructi drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be function				■															
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchori This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired locati				■															
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ens appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habitat				■															
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functio				■															
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in g repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate e				■															
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. Items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■															
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■															
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■															

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C-6 Treatment Buildings

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory b breeding season where practical (April 15 to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC) ar													■						
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep ev													■						
Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season													■						
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that wil submitted to NSE													■						
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new road laydowns without the Contract Administrators (CAs) approval													■						
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■															
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to requ an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish hab				■															
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■			■						
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion																	■	■	
Inspect all buildings for presence of nests before demolition													■			■			
Conduct vegetation management by cutting (e.g., no use of herbicides)											■							■	
Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird Species at Risk (SAR) and work with ECCC to prevent any future mortalities or injuries																■			
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leaka													■			■			
Ensuring regulatory compliance in transporting Dangerous Goods														■					
Adequate driver training and training in accident or malfunction protocols														■					
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights														■					
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation					■														
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																	
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete operator training for identification of potential archaeological/cultural heritage resources		■																	
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																	
In the event that archaeological/cultural resources are encountered during waste management activities, all work wil halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembl		■																	
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																	
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■				
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions									■										
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely									■						■				
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.											■								

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Appendix C-7
Dam

C-7 Dam

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Cover stockpiles on-site to reduce emissions of particulate matter from wind erosion					■														
Cover the dredged sediment and infill material properly to minimize the exposed area and the potential odour emissions with tarps and or neutralizing foam, as necessary					■														
Keep waste material contained through use enclosed dredging piping and geotubes					■														
Reduce engine idling where possible and use fuel efficient vehicles and equipment to reduce diesel combustion emissions, as well as conduct regular equipment maintenance					■														
Any vehicles will be stopped if emitting excessive exhaust smoke or those that have had emission control equipment tampered with, or removed					■														
Equipment and machinery will be well maintained, and equipped with fully functional emission control systems, muffler, exhaust baffles, engine covers, etc.					■														
Machines will not be left to idle in order to avoid unnecessary emissions. Extreme circumstances where idling may required will be reviewed with and approved by the Contractor(s) Environmental Manager (EM) and the Construction Management and Oversight Services Consultant (CMOC) EM in advanc					■														
Fuel efficient vehicles and equipment will be used where possible to reduce diesel combustion emissions, as well as regular equipment maintenance conducted					■														
Burning of any material, including the disposal of combustible waste material will not be permitted					■														
Mud mats will be installed at the entrance/exit of all access roads which will be capable of sufficiently remov sediment (mud and debris) from vehicles to prevent dust and sediment from being dispersed off Site onto local roads. Equipment that has come into direct contact with sediment (excavators, earth moving equipment, dredges) will					■														
The use of salts or petroleum products for dust control are prohibited. The Contractor will use water as a d suppressant to prevent the release of sediment from roads, laydown areas, and staging areas but will not be applied in volumes which could contribute to erosion and uncontrolled run-off. The Contractor should be prepared to increase t					■														
If dry excavation and/or heavy construction activities are completed as part of the full-scale remediation program, a S Specific Environmental Protection Plan (EPP) for fugitive dust best management program (FDBMP) will be prepared for the Site to address any potential for fugitive dust issue					■														
Dry materials, stockpiles , and rubbish will be securely covered (plastic sheeting, tarps, etc.) when possible					■														
All dust generating equipment will have functioning mounted dust collection devices					■														
Manage dust emissions through the use of water on non-paved roads or excavated/exposed areas and through cleaning of paved roads, where applicable and based on regulatory direction and approval	■												■					■	
Restrict traffic generally to 16 hours per day during the construction and operation phases			■						■						■				
Site designed to minimize the need for reversing and vehicle reversing alarms															■				
Proper muffling devices will be used to minimize noise from construction activity and timing and location of these activities will be selected to further reduce or minimize the effect of noise on the environment															■				
Loud equipment will only be operated when required (e.g., generators, compressors, etc.) and if needed, sound shielding or dampening devices will be used															■				
All equipment and vehicles will not be permitted to idle their engines when possible and be properly maintained such that their operation conforms to typical noise parameters															■				
Administrative controls such as staged construction to limit simultaneous operation of bad actors															■				
Procure equipment that meets or exceeds industry standards in terms of noise levels, and regular maintenance of the equipment will reduce noise levels															■				
Undertake regular maintenance of the equipment as part of the preventative maintenance plans implemented for all mobile and stationary equipment															■				
Train site workers to ensure equipment is used in ways that minimize noise and are maintained regularly			■												■				
Contractor agreements will include an obligation to ensure noise levels at the property limit meet provincial and local regulations, permits, and approvals															■				
Locate stockpile areas and infrastructure in the central portions of the Site, further from sensitive receptors surround the Site. Regular check by Contractor(s) EM for excessive noise on-site and in relation to sensitive receptors so that resolution can be timely															■				
Implement the Compliant Procedure Protocol outlined in Section 10.2 of the Environmental Management Plan (EMP) prepared under separate cover										■					■				
Install, wherever possible, motion-sensor to ensure lights are not turned on when they are not necessary										■									
Only direct and focused light will be used for worker safety										■									
The Contractor will reduce the amount of unnecessary artificial lighting while maintaining the minimum visible requirements for construction activities are still being met										■									
The current schedule proposes transport trucks entering and leaving the Site between 12 and 16 hours a day, but not during or after curfew (post-curfew) hours (after 11:00 p.m.). No other proposed lighting will exist along the haul route										■									
Include an obligation to comply with environmental protection including light reduction in Subcontractor agreements										■									
In areas where sludge is to be completely removed, remaining sediments will meet risk-based sediment criteria that is protective of ecological and human health						■													
Develop and implement a Spills Management Plan (SMP) and fully communicate its procedures to staff to protect adjacent habitats, surface water, wetland habitat, and amrine environment from accidental spills				■		■		■				■					■	■	■
Monitor and manage a Temporary Leachate Treatment Facility (TLTF) and effluent conveyance piping to ensure no release occurs						■													
Monitor to limit/eliminate the mobilization of impacted material to other areas of the Site that have not been previously impacted (i.e., soil, wetlands, watercourses, habitats)						■													
Remove impacted sediments to meet risk-based sediment criteria specified in the QA/QC Program for dredging						■													
Install cofferdam up and down stream of the dam						■													
Monitor suspended solids concentration to ensure the use of cofferdam is performing and if repair as needed						■													
Protection of ground water will include both the prevention of contamination and potential changes to the down gradient of water flow from construction activities								■											
Monitoring protocols for perimeter groundwater wells for contaminants of concern								■											
Construction of a leachate holding tank with appropriate seals with mitigation measures in place to contain spills when pumping from the holding tank to tanker truck to haul leachate off-site								■											

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C-7 Dam

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Plans to monitor and maintain leachate collection system within CC								■											
Reduce interaction between surface water and groundwater by implementing surface water mitigation measures and BMPs								■											
Minimize travel across areas of exposed soil to reduce compaction of the soil. Utilize pre-constructed temporary access points as indicated for equipment access.																	■	■	■
During Site Preparation and Construction phase of the project, monitoring groundwater elevations and quality.								■											
The use of silt curtains to control sedimentation																	■		
Control effluent discharge to estuary at the outlet control structure to respect the Total Suspended Solids (TS Canadian Council of Ministers of the Environment (CCME) criteria (< 25 mg/L from background level), confirm by applying a TSS monitoring prograr																	■		
Outline the Contractor's responsibilities and actions associated with the protection of clean water from waste water																	■		
Manage construction and roadway runoff through natural vegetation and/or sediment controls such as a silt fence or bales.																	■		
Utilize cofferdam and bypass pumping approach around dam work area to provide more secure controls in tidally influence area.											■	■							
Conduct construction and major operations within wetlands and estuary outside critical periods for the protection of aquatic life as defined by DFO (spawning, migration, etc.) to avoid impacts to wildlife during sensitive life stages.																	■		
Avoid the storage of hazardous material or equipment containing hazardous material overnight in isolated areas of a waterbody or wetland (e.g., cofferdam), with the exception of dewatering pumps due to the increased risk of flood				■								■					■		■
Develop and implement a refueling plan for approval by CMOC EM, as refueling will need to take place on or n water. This will include the requirement for equipment to be fitted with emergency controls to limit leakage and the requirement to have floating spill containment booms on hand during refueling activities near wa																	■		
Confirm background TSS in the estuary before beginning remediation work to use as a baseline to compare the results from the TSS monitoring that will be completed during remediation																	■		
Implement surface water BMPs to respect the TSS CCME criteria (< 25 mg/L from background level) and confirm by applying a TSS monitoring program																	■		
Install additional silt curtains in the water upstream and downstream of the dam decommissioning works to control the migration of silt generated as a result of the dam removal.																	■		
Maintaining existing vegetation cover is the best and most cost-effective erosion control practice.																		■	
To reduce the potential for introduction of non-native species, equipment that is brought to Site shall be cleaned prior to arrival and inspected for cleanliness prior to commencing work.																		■	
Use clean, non-ore-bearing, non-watercourse derived and non-toxic materials for erosion control methods																		■	
Implement all Erosion and Sediment Control (ESC) practices prior to any soil disturbing activities, where applica including silt fencing, silt curtains, controlled access points, diversion swales, and mud mats, as pe*Erosion and Sedimentation Handbook for Construction Sites* (Nova Scotia 1988)											■						■	■	■
Complete erosion and sediment control planning to ensure Site runoff is not directed towards a partially impacted wetland or fish habitat																			■
Clean and inspect equipment that is brought to Site prior to commencing work to reduce the potential for introduction of non-native species																		■	
Establish construction methods, such as working from up-gradient to down-gradient that reduce the potential to drair flood a partially altered wetland or down-gradient wetland via indirectly altered hydrology due to remediation, site dewatering, or road constructio																		■	
Limit driving and use of machinery within wetland habitat where practical with use of swamp mats/corduroy bridges in wet areas to prevent rutting, diverting water flow, and sedimentation																		■	■
Implement wetland compensation plan (to be developed post General Contract)																			■
Complete pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Stabilize and re-vegetate slopes to limit erosion and sedimentation into each adjacent wetland																			■
Implement Site speed limits including signage to increase awareness for personnel, and reduce dust emissions				■	■							■	■						■
Compensate for loss of wetland functions that support mammals and wildlife as part of the wetland compensation plan to be submitted to Nova Scotia Environment (NSE)																			■
Complete remediation activities within wetlands outside the known breeding bird window where possible, or nes surveys shall be completed prior to commencing remediation based on Project approval terms defined by ECC and Nova Scotia Environment (NSE)																			■
Conduct pre-construction Site meetings with relevant construction staff to educate staff on the locations of wetlands and policies related to working around wetlands and watercourses																			■
Maintain riparian buffer zones surrounding watercourses and wetlands to ensure crown closure is unaltered, and that sunlight does not influence water temperature more than currently																		■	■
Conduct nesting site surveys prior to the excavation or removal of wetland areas																			■
Securely lock up all hazardous materials (e.g., oils, lubricants, fuels, paints, solvents, paint thinners, etc.) when not in use in the office yard to avoid vandalism and accidental spills				■								■					■		■
Transfer all deleterious substances (including fuel, cleaners, solvents, paint, etc.) at designated refuelling areas that are equipped to handle a potential spill to limit the release of deleterious substances to the surrounding environment				■								■					■		■
Maintain riparian wetland and watercourse buffers (where practical) to reduce adverse effects to wetlands, watercourses, and downstream receiving environments by clearly defining the limits of work											■							■	■
Maintain speed limits in Project area, reduce speed and install signage where specific wildlife concerns have been identified											■								
Noise controlled by attenuation (distance between source and receptor) vertical separation, and equipment design where feasible											■		■						
Wildlife awareness training will be provided to all Site personnel during S-specific orientation, wildlife awareness training will include measures to reduce interactions between Site personnel and wild species and reporting of poach activity within the vicinity of the Boat Harbour Effluent Treatment Facility (BHETF											■								
Establish wildlife reporting protocol so wildlife activity can be tracked throughout the BHETF. This information can be used to install signage, if appropriate, in areas with high wildlife sightings											■					■			
Daily and on-going observations for general wildlife activity shall be undertaken by all personnel on site											■								
Should wildlife enter the construction zone, all work shall cease, and the species identified, if possible. The Contrac EM and CMOC EM shall be notified. Personnel will stand back and allow the animal to leave the site. The wildlife should not be approached or handled. The Contractor EM will contact Nova Scotia Lands Inc. (NSLI) (via the CMC											■								
A record of the encounter shall be noted on the daily environmental inspection checklist and detailed in a wild observation report (Appendix D-3). These reports shall include, but are not limited to, the location, date/time of the encounter, the species involved, condition of the animal, and photos (if taken). This wildlife reporting protocol will											■								

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C-7 Dam

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Should the animal be resident within the site (remaining on site longer than 24 hours), injured, or eggs/nests a observed, additional measures to avoid impacts may be required before work can restart. The Contractor EM and CMOC EM shall be notified for direction. If necessary, the CMOC EM shall contact NSLI's Environmental Assessme											■								
Parking, laydown and storage shall only be permitted in designated areas and limited to existing disturbances to the extent possible. Work spaces shall be clearly delineated											■								
Daily housekeeping will ensure that the construction area is kept clean and free of potential hazards for wildlife, such as wire or tubing. Chemicals will be kept in wildlife-proof containers											■								
Waste will be stored, handled and transported in accordance with the site waste management plan. All waste is to stored in wildlife-proof containers and regularly removed from the Site. Removal is to occur weekly, or at more regular intervals as appropriate, such as in times of warm weath											■								
The feeding, harassment, hunting or trapping of wildlife by Site personnel is prohibited. Anyone caught feeding, harassing, hunting or trapping wildlife during this project will lose Site privileges				■							■		■						
Limit clearing to approved alteration areas											■					■			
Set appropriate speed limit on-site to help reduce the probability of vehicular collisions, or collisions between vehicles and mammals and wildlife											■					■			
Provide wildlife awareness training to all Site personnel during Site-specific orientation. Wildlife awareness training will include measures to reduce interactions between Site personnel and wild species											■					■			
Store hazardous and non-hazardous waste in designated locations, in a dry location that is clean and well ventilated appropriate to the material, including impermeable pads a minimum of 30 m from water or wetlands and handled in a manner which prevents release into the environmentin appropriate containers to reduce potential for spills, and				■							■	■				■	■		■
Manage contaminated silt though the use of silt curtains, on-site drainage control, and proper storage of impacted materials											■					■			
Control noise by attenuation (the distance between a noise source and a receptor), vertical separation, and equipment design where feasible											■		■			■			
Identify natural channel s running through estuary and wetlands prior to remediation to protect the integrity of hydrology in the wetland.											■								■
Complete pre-construction site meetings to educate staff on policies related to working around the estuary. Personnel will be instructed not to enter areas of the estuary that are outside of approved alteration areas												■							
Construction staff will be educated on the limits of the estuarine and/or marine areas and instructed to not enter areas outside of approved alteration areas												■							
Identify and communicate to staff the schedule of construction activities as it relates to alteration of estuary, wetland, or general fish habitat.																			■
Enforce Site-specific terms and conditions in the approval for all work associated with alterations in the Estuary and wetland alterations.																			■
Use a "moon pool" system complete with dual perimeter curtains during any dredging within the estuary to limit an increase in TSS in adjacent areas .											■								
Ensure containment tray in place, and a portable spill kit will be on hand prior to any refuelling activities to ensure immediate containment of a spill				■								■					■		■
Ensure proper ESC measures are in place prior to the removal of the dam control structure including use of silt curta in conjunction with sedimentation additional measures such as a "moon pool" system												■							
Ensure adequate remediation has taken place, and impacted sludge is removed before releasing process water into the Northumberland Strait												■							
Care will be taken to keep riparian vegetation in good condition surrounding areas of potential fish habitat, no herbic shall be used near possible fish habitat				■								■							
ESC planning will be completed to ensure site runoff is not directed towards fish habitat				■															
Compensation for permanent loss of fish habitat will be completed through fish habitat restoration activities, subject to Department of Fisheries and Oceans Canada (DFO), based on the Fisheries Act current at time of the Project				■															
Work should only commence following the installation of appropriate ESC measures as shown on the constructi drawings. This includes the use of dual turbidity curtains in areas to be dredged. These measures should be inspected by the Contractor EM and/or CMOC EM and determined to be function				■															
Turbidity curtains will be installed in such a manner to flush out fish from the intended work area prior to anchorii This will be completed by installing the turbidity curtains flush with the shoreline or an established structure and slowly pulling the curtain away from the structure/shoreline until it is in the desired locati				■															
As required, qualified biologists will be present for turbidity curtain installation and removal activities to ens appropriate protocols are followed and prevent death of fish and harmful alteration, disturbance, or destruction (HADD) of fish habitat				■															
Turbidity curtains will be inspected regularly and prior to commencing dredging activities. Evidence of leaks, sagging other signs that the measure is not preforming as required will be monitored. Any deficiencies will be immediately addressed and dredging activities will not commence until turbidity curtains are deemed functio				■															
Any equipment, machinery, or tools to be utilized in or immediately adjacent to the water should be clean and in g repair. All machinery should be inspected for fluid leaks or other potential pollutants. Vegetable based hydraulic fluid will be required for all equipment working in or directly adjacent of the water. The Contractor should evaluate e				■															
All machinery, materials, and equipment not in use should be stored within areas surrounded by ESC measures. items should be stored within 30 metres of the shoreline, without approval from NSLI (via the Contractor EM and/or CMOC EM).				■															
All work in and around water will take place in accordance with DFO Fisheries Act Authorization, including within the appropriate fish timing window of Month day to Month Day when applicable				■															
If any death of fish or HADD of fish habitat is identified beyond what is outlined in the DFO Fisheries Act Authorization, work will be halted until the issue can be appropriately addressed				■															
Avoid construction, including clearing and grubbing or other removal of native vegetation during the migratory b breeding season where practical (April 15 to August 30th), where this is not possible, a bird nest mitigation plan will be developed prior to construction and in consultation with Environment & Climate Change Canada (ECCC) a													■			■			
As part of the bird nest mitigation plan, a nest survey will be required to be completed by a qualified biologist. This identify any active nests and/or breeding activity of migratory birds that may indicate nesting. Nest survey information will be considered valid for a maximum of seven (7) days following the sweep ev													■						
Routes for machinery are to be shown on a figure, and then ground-truthed and corridors are to be surveyed for nesting birds during nesting season													■						
Compensate for lost wetland functions that support migratory birds as part of the wetland compensation plan that wil submitted to NSE													■						
Contractors must stay within the approved project boundary. The Contractor is not authorized to construct new roads laydowns without the Contract Administrators (CAs) approval													■						
Provide copies of relevant maps and digital format locations of fish habitat as well as approvals, terms and conditions, as it pertains to the contractor, all terms and conditions				■															
Adhere to wetland and watercourse alteration and general construction schedules												■							
Avoid fish habitat wherever possible during detailed project planning and design																		■	■
Submit surface water alteration applications (wetlands and watercourses) during Project planning and design to requ an authorization to alter fish habitat, loss of fish habitat will be addressed in these alteration applications and recommended timing windows will be adhered to for potential direct loss of fish and fish hab				■															
Limit clearing within wetland and watercourse fish habitat outside of approved alteration areas																		■	
Euthanize fish in a culturally sensitive manner that will be determined in consultation with PLFN				■															

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C-7 Dam

Measure	Air Quality and Odour Control	Archaeological / Cultural Heritage Resources	Economic and Social	Fish and Aquatic Habitat	General Construction Procedures	Geology, Geochemistry, and Soil	Greenhouse Gas	Groundwater	Human Health	Light	Mammals and Wildlife	Marine Environment	Migratory Birds	Mi'Kmaq of Nova Scotia	Noise	Species at Risk	Surface Water	Terrestrial Habitat and Vegetation	Wetlands
Construction crews to adhere to wetland and watercourse alteration and general construction schedules				■															
Ensure proper sediment and erosion controls are in place prior to the removal of the flow control structure such as silt curtains				■															
Instruct and personnel to avoid entering any areas specifically including wetlands and watercourses outside of approv alteration areas with machinery				■							■	■				■			■
Cover large piles or patches of bare soil or un vegetated areas during the breeding season, wherever possible discourage ground nesting or burrow nesting species (such as common nighthawk and bank swallows), large piles or patches of bare soil will not be left uncovered or un vegetated during the breeding season, wherever poss													■			■			
Work with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground or burrow nesting species initiate breeding activities on stockpiles or exposed areas													■						
Install downward facing lights on site infrastructure, roads, and bridge to reduce light pollution on site										■			■						
Maintain existing vegetation cover whenever possible and minimize overall areas of disturbance to reduce the potential for erosion											■					■	■	■	■
Re-vegetate slope between the edge of project infrastructure, roads or stockpile locations, or ditch and adjacent wetlands will be revegetated to stabilize the slope and limit erosion and sedimentation into adjacent habitats																		■	
Employ measures to reduce the spread of invasive species including cleaning and inspecting vehicles will be employed wherever possible to maintain the quality of remaining habitat											■					■			
Conduct vegetation management by cutting (e.g., no use of herbicides)				■							■	■				■		■	■
Notify ECCC within 24 hours in the event of the mortality or injury of a single or more migratory bird Species at Risk (SAR) and work with ECCC to prevent any future mortalities or injuries																■			
over large piles or patches of bare soil or un vegetated areas during the breeding season, wherever possible to discourage ground nesting or burrow nesting species (such as common nighthawk and bank swallows)																■			
SWork with ECCC and NSE to develop buffer and non-disturbance distances and zones that incorporate adaptive management should any ground or burrow-nesting species initiate breeding activities on stockpiles or exposed areas																■			
Refueling of any land-based equipment will occur 30 m from the estuary, identified habitats of wildlife, or tributaries refueling plan will be implemented for refueling that will occur on or near water within Boat Harbour. This will include the requirement for equipment to be fitted with emergency controls to limit leaka											■		■			■		■	■
Implement mitigation measures and ensure all other remedial procedures are complete prior to introduction of tide																■			
Ensuring regulatory compliance in transporting Dangerous Goods														■					
Adequate driver training and training in accident or malfunction protocols														■					
All accommodations in Section 7.4.12 to restore Aboriginal and Treaty Rights														■					
Employ BMPs for loading and transportation of contaminated materials. Cover all materials being loaded onto vehicles or transported to/from site to limit the amount of particulate matter being emitted from material transportation					■														
Ensure proper road signage			■																
In areas ascribed as high archaeological potential, complete additional shovel testing, as required, prior to ground disturbance		■																	
Complete Site-specific background research, shovel testing and/or test excavation for ground disturbances within 50 m of the identified archaeological sites		■																	
Complete operator training for identification of potential archaeological/cultural heritage resources		■																	
Implement construction monitoring throughout the duration of the Project in areas that will be disturbed and are identified currently as moderate to high archaeological potential		■																	
In the event that archaeological/cultural resources are encountered during waste management activities, all work will halted and immediate contact made with the Coordinator of the Special Places Program. In the event that human remains are encountered, immediate contact will be made with the Coordinator of Special Places and Assembl		■																	
Complete underwater archaeological reconnaissance if ground disturbance is required as part of the Project activities within the waters of the East River of Pictou (underwater pipeline corridor)		■																	
Review Archaeological assessment reports for areas of avoidance		■																	
Complete additional shovel testing, as required, prior to ground disturbance in areas ascribed as high archaeological potential		■																	
Halt all work and make immediate contact with the Coordinator of the Special Places Program if archaeological/cultural resources are encountered during waste management activities		■																	
Immediately contact the Coordinator of Special Places and Assembly of Nova Scotia Mi'kmaq Chiefs via the Kwilmu' Maw-klusuaqn Negotiation Office in the unlikely event that human remains are encountered		■																	
BMPs for noise, light, and air emission control during construction activities will be followed at a minimum such as equipment management, worker training, preventative maintenance plans and a complaint response plan			■						■						■				
Minimize potential odour emissions by properly covering the dredged sediment to minimize the exposed area and the potential odour emissions									■										
Regular checks by the Contractor(s) for excessive noise on-site and in proximity to sensitive receptors so that resolution can be timely			■						■						■				
Adjust volume and speed limits appropriately to conditions at the time (i.e., dry weather and dust) and temporary lights will be used to regulate traffic flow.											■								

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Appendix D
Sample Environmental Monitoring Inspection Reports

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Appendix D-1
Sample Daily Site Inspection Form

Appendix D-1 Daily Site Inspection Form

Project Name: **Location:**

Project No.: **Date:**

Stage of Construction		Prime Contractor	
Construction Activities		Site Supervisor	

Date	Time	Reason for Inspection	Weather During Inspection		Weather Previous Hours	
			Conditions	Temp (°C)	Conditions	Rain/Snow (mm)
		☐ Daily Inspection ☐ Before Rain/Melt Event ☐ Post Rain/Melt Event ☐ Spill/Incident ☐ Other _____	☐ Clear ☐ Part. Cloud ☐ Cloudy ☐ Rain ☐ Snow ☐ Fog		☐ Clear ☐ Part. Cloud ☐ Cloudy ☐ Rain ☐ Snow ☐ Fog	

Tree Protection

	Y/N	Comments
Are tree protection fencing installed per approved plan?		
Have all repairs and maintenance tasks identified in the previous report completed by the end of the week?		
Have any trees or vegetation been harmed?		
Are there locations where additional tree protection could be installed?		
Are there locations where removing existing tree protection could be considered?		

Wildlife

	Y/N	Comments
Was any wildlife encountered in the work area? (Report to Site Supervisor w/ location observation and photo)		
Any resident wildlife observed on Site? (>24 hours)		

Equipment/Material Storage & Stockpiles

	Y/N	Comments
Are laydown areas properly designated?		
Are stockpiles used & contained properly?		
Is refueling occurring in designated areas?		
Is any equipment showing signs of leaks?		
Are drip trays and containment systems being used properly?		
Are spill response kits fully stocked & in place?		

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General Site Conditions	Y/N	Comments
Are work areas properly delineated with construction occurring inside designated areas?		
Is construction perimeter fencing up & protecting proper areas?		
Are waste collection bins full and require pickup?		
Are there completed areas where construction waste/debris should be removed?		
Was the site supervisor or contractor notified of new issues and/or deficiencies identified during the week?		

Additional Comments:

☐ Photos attached

Name of Inspector(s): _____

Name of Environmental Monitor: _____

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Appendix D-2
Sample Erosion and Sediment Control Inspection Form

Appendix D-2 Erosion and Sediment Control Inspection Report

Project Name: **Location:**

Project No.: **Date:**

Stage of Construction		Prime Contractor	
Construction Activities		Site Supervisor	
Annotated ESC Plan/Map Attached		Site Photos	

Date	Time	Reason for Inspection	Weather During Inspection		Weather Previous Hours	
			Conditions	Temp (°C)	Conditions	Rain/Snow (mm)

Sediment Control

- ☐ Silt Fence
- ☐ Cofferdam
- ☐ Straw Bale
- ☐ Filter Bag
- ☐ Mud Mat
- ☐ Sediment Basin
- ☐ SWM Pond
- ☐ Straw/Coir Log
- ☐ Vegetative Strip
- ☐ Berm
- ☐ Catch Basin/Curb Inlet Control
- ☐ Storm Outfall Control
- ☐ Turbidity Curtain
- ☐

	Y/N	Comments
Are sediment controls installed per approved ESC plan?		
Have all repairs and maintenance tasks identified in the previous report completed by the end of the week?		
Was runoff within the construction area fully contained?		
Were soil stockpiles properly isolated?		
Was the water quality in leaving the site affected by current site conditions?		
Are there locations where additional sediment controls could be installed?		
Are there locations where removing existing sediment controls could be considered?		

Erosion Control

Check Dam:
- ☐ Straw Bale
- ☐ Rock
- ☐ Coir Log

Re-vegetation:
- ☐ Hydro-seed (estab.)
- ☐ Terra-seed
- ☐ Sod
- ☐ Seeding (estab.)
- ☐ Natural

- ☐ Turf Reinforcement Mat
- ☐ Erosion Control Blanket
- ☐ Scarification
- ☐ Undisturbed Ground Cover
- ☐ Straw Mulch
- ☐

	Y/N	Comments
Are erosion controls installed per approved ESC Plan?		
Have all repairs and maintenance tasks identified in the previous report completed by the end of the week?		
Are there areas that require immediate soil stabilization (e.g., slopes and embankments)?		
Are there locations where additional erosion controls could be installed?		
Are there locations where removing existing erosion controls should be considered?		

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Additional Comments:
☐ Photos attached
Name of Inspector(s): _____ **Name of Environmental Monitor:** _____

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Appendix D-3
Sample Wildlife Observation Form

Appendix D-3 Wildlife Observation Form

Project Name: **Location:**

Project No.: **Date:**

Stage of Construction		Prime Contractor	
Construction Activities		Site Supervisor	

Date	Time	Weather		
		Conditions	Temp (°C)	Rain/Snow (mm)

Species:	**Please provide a description of the animal observed.** **☐ Bird ☐ Bat ☐ Frog ☐ Salamander ☐ Snake ☐ Turtle ☐ Fish** **☐ Other Mammal _____** **Level of Certainty in Species Identification : HIGH MEDIUM LOW** **☐ Adult ☐ Juvenile ☐ Egg ☐ Larval ☐ Unknown ☐ Male ☐ Female ☐ Unknown**
Comments:	
Location **UTM Zone _____** **Easting _____** **Northing _____**	**Where did the observation take place?** **☐ Forest ☐ Scrubland ☐ Wetland ☐ Grassland/Herbaceous ☐ River/Stream ☐ Road** **☐ Trail ☐ Barren/Rocky ☐ Agricultural Field ☐ Within Construction Work Area** **☐ Other _____** **Distance from Animal (in meters) _____**
Comments:	
Condition	**Please describe the condition of the animal** **☐ Healthy ☐ Emaciated ☐ Injured ☐ Dead ☐ Unknown ☐ Other _____**
Comments:	

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Observation	**Describe what the animal was doing, and what happened over the course of the observation.**
Species Activity	☐ **Walking** ☐ **Sleeping** ☐ **Hunting** ☐ **Following** ☐ **Stalking** ☐ **Resting** ☐ **Sitting** ☐ **Standing** ☐ **Nesting** ☐ **Rooting** ☐ **Flying** ☐ **Eating** ☐ **Calling** ☐ **Other: _____**
Species Response	☐ **Fled** ☐ **Watched** ☐ **Left on its own** ☐ **Ignored People** ☐ **Followed People** ☐**Signs of Aggression (laid back ears/bared teeth, etc)** ☐ **Other _____** ☐ **None**
Observer Response	☐ **Remained Still** ☐ **Backed Away** ☐ **Made Loud Noise** ☐ **Driving** ☐ **Other _____**

Comments:

Miscellaneous

	Yes	No	Comments
Do you believe the animal observed was a Species at Risk?	☐	☐	
Do you suspect the animal was harmed by construction related activities?	☐	☐	
Were you able to photograph the animal?	☐	☐	

Additional Comments:

☐ Photos attached

Name of Observer(s) _____

Name of Environmental Monitor: _____

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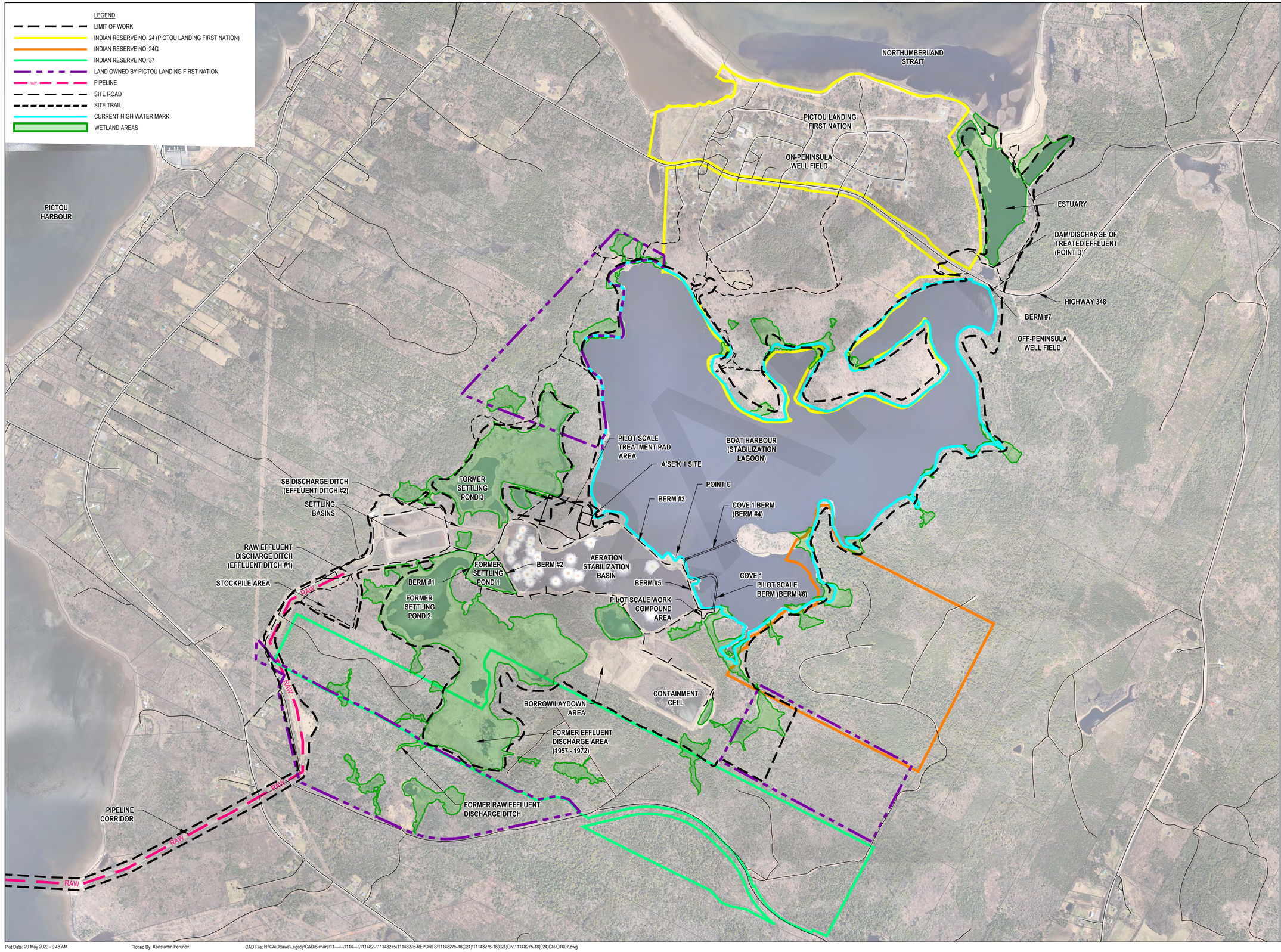
Appendix D-4
Equipment Inspection Form
(PROVIDED BY CONTRACTOR)

DRAFT

Appendix E
Construction Drawings Set



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AERIAL PHOTO - NS LANDS, MAY 15, 2015

Client
NS LANDS - BOAT HARBOUR PICTOU LANDING, NOVA SCOTIA

Project
BOAT HARBOUR REMEDIATION

No.	Issue	Drawn	Approved	Date
4	PRE-TENDER DELIVERABLE	DC	BS	05-21-2020
3	95% DESIGN REVIEW	DC	BS	03-12-2020
2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

Drawn	D. CORKILL	Designer	D. CORKILL
Drafting Check	B. SAMUELL	Design Check	B. SAMUELL
Project Manager	C. SKIRTH	Date	May 21, 2020
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Project No. **11148275**

Title
OVERALL EXISTING CONDITIONS

Sheet No.
GG-G-03

Sheet of

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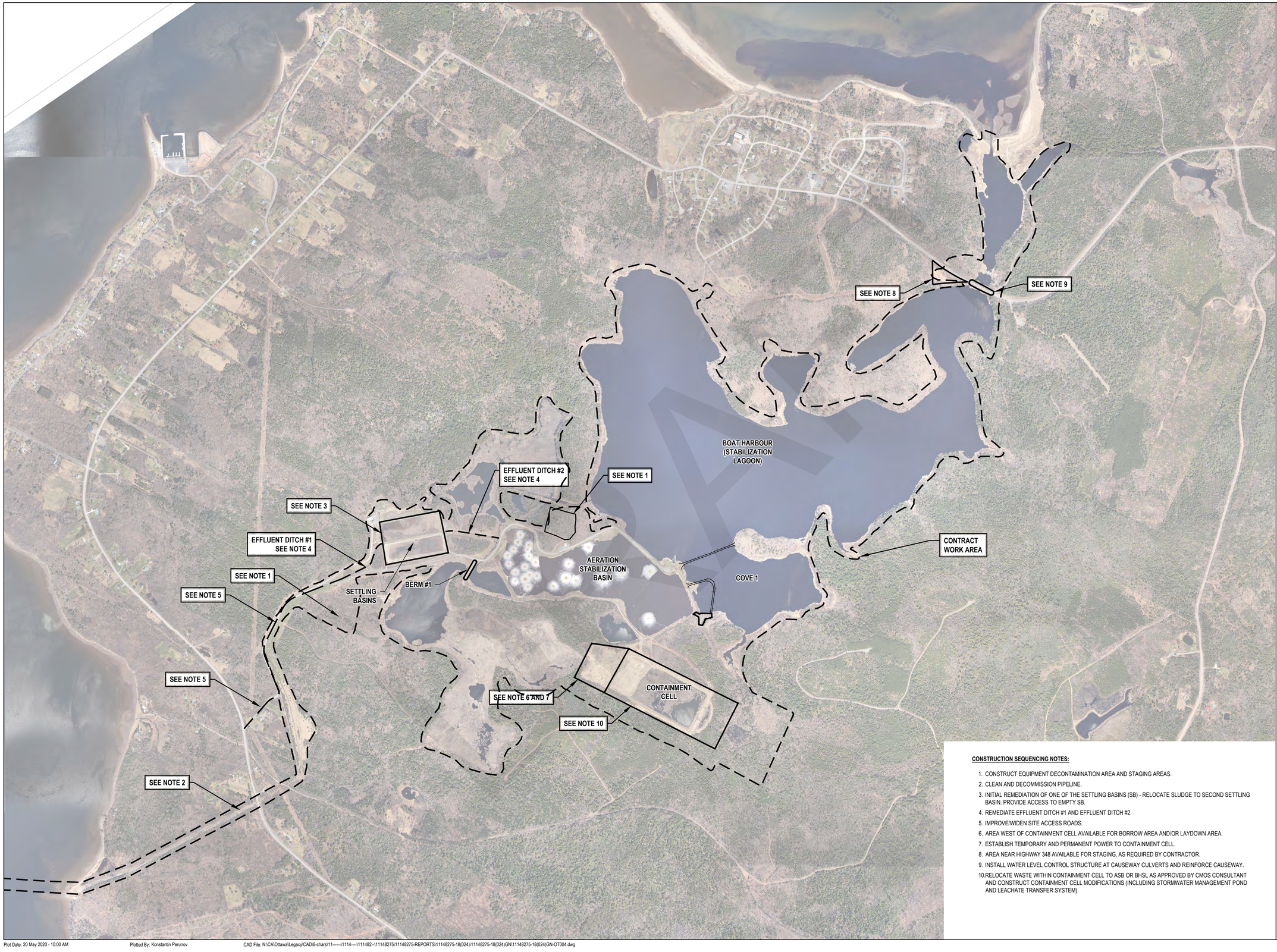

CONSTRUCTION SEQUENCING NOTES:

1. CONSTRUCT EQUIPMENT DECONTAMINATION AREA AND STAGING AREAS.
2. CLEAN AND DECOMMISSION PIPELINE.
3. INITIAL REMEDIATION OF ONE OF THE SETTLING BASINS (SB) - RELOCATE SLUDGE TO SECOND SETTLING BASIN. PROVIDE ACCESS TO EMPTY SB.
4. REMEDIATE EFFLUENT DITCH #1 AND EFFLUENT DITCH #2.
5. IMPROVE/WIDEN SITE ACCESS ROADS.
6. AREA WEST OF CONTAINMENT CELL AVAILABLE FOR BORROW AREA AND/OR LAYDOWN AREA.
7. ESTABLISH TEMPORARY AND PERMANENT POWER TO CONTAINMENT CELL.
8. AREA NEAR HIGHWAY 348 AVAILABLE FOR STAGING, AS REQUIRED BY CONTRACTOR.
9. INSTALL WATER LEVEL CONTROL STRUCTURE AT CAUSEWAY CULVERTS AND REINFORCE CAUSEWAY.
10. RELOCATE WASTE WITHIN CONTAINMENT CELL TO ASB OR BHSL AS APPROVED BY CMOS CONSULTANT AND CONSTRUCT CONTAINMENT CELL MODIFICATIONS (INCLUDING STORMWATER MANAGEMENT POND AND LEACHATE TRANSFER SYSTEM).

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BOAT HARBOUR REMEDIATION

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Drawn	D. CORKILL	Designer	D. CORKILL
Drafting Check	B. SAMUELL	Design Check	B. SAMUELL
Project Manager	C. SKIRTH	Date	May 21, 2020
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Project No. **11148275**

Title
GENERAL STAGING 1 OF 4

Sheet No.
GG-G-04

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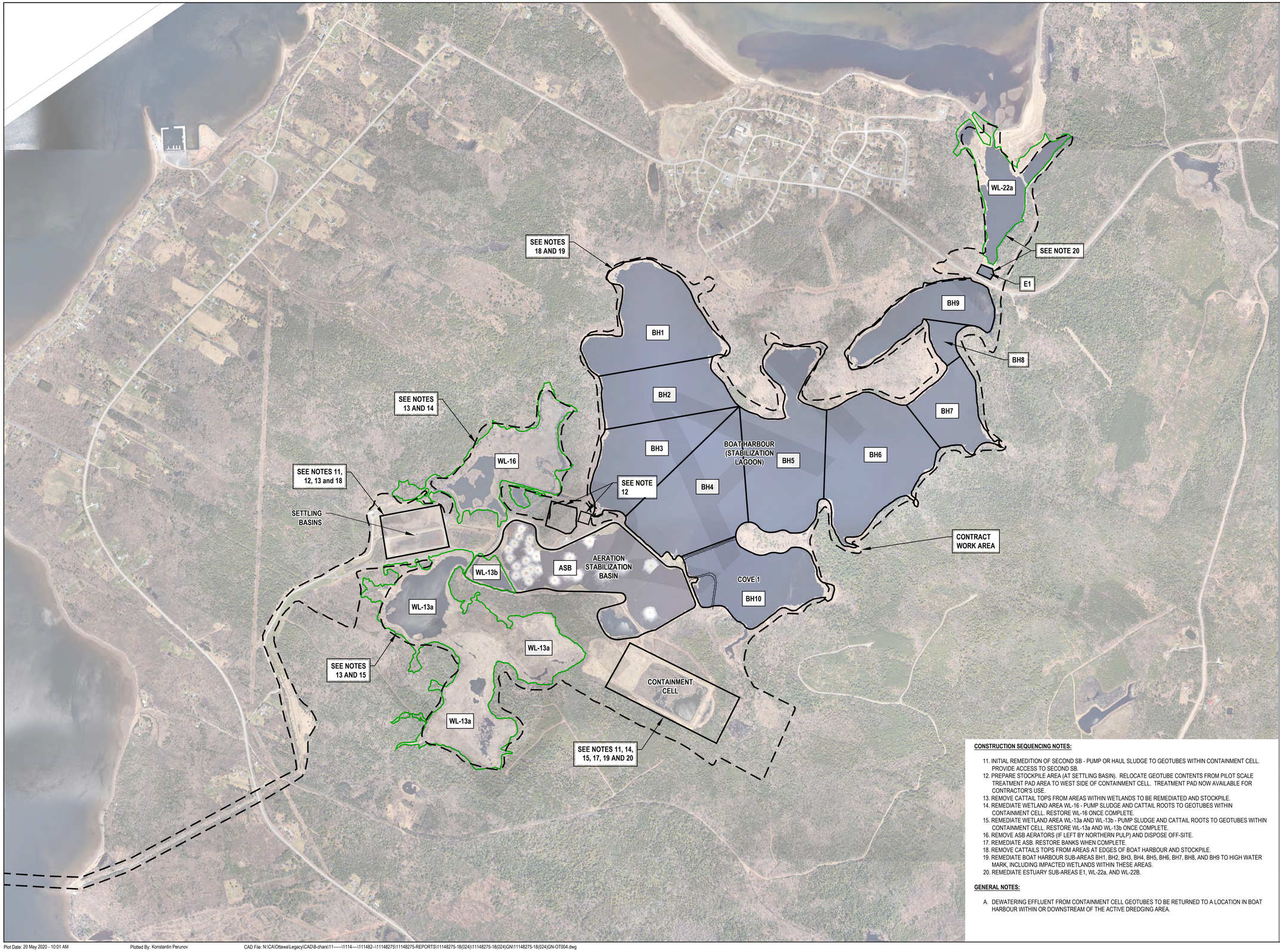

CONSTRUCTION SEQUENCING NOTES:

11. INITIAL REMEDITION OF SECOND SB - PUMP OR HAUL SLUDGE TO GEOTUBES WITHIN CONTAINMENT CELL. PROVIDE ACCESS TO SECOND SB.
12. PREPARE STOCKPILE AREA (AT SETTLING BASIN). RELOCATE GEOTUBE CONTENTS FROM PILOT SCALE TREATMENT PAD AREA TO WEST SIDE OF CONTAINMENT CELL. TREATMENT PAD NOW AVAILABLE FOR CONTRACTOR'S USE.
13. REMOVE CATTAIL TOPS FROM AREAS WITHIN WETLANDS TO BE REMEDIATED AND STOCKPILE.
14. REMEDIATE WETLAND AREA WL-16 - PUMP SLUDGE AND CATTAIL ROOTS TO GEOTUBES WITHIN CONTAINMENT CELL. RESTORE WL-16 ONCE COMPLETE.
15. REMEDIATE WETLAND AREA WL-13a AND WL-13b - PUMP SLUDGE AND CATTAIL ROOTS TO GEOTUBES WITHIN CONTAINMENT CELL. RESTORE WL-13a AND WL-13b ONCE COMPLETE.
16. REMOVE ASB AERATORS (IF LEFT BY NORTHERN PULP) AND DISPOSE OFF-SITE.
17. REMEDIATE ASB. RESTORE BANKS WHEN COMPLETE.
18. REMOVE CATTAILS TOPS FROM AREAS AT EDGES OF BOAT HARBOUR AND STOCKPILE.
19. REMEDIATE BOAT HARBOUR SUB-AREAS BH1, BH2, BH3, BH4, BH5, BH6, BH7, BH8, AND BH9 TO HIGH WATER MARK, INCLUDING IMPACTED WETLANDS WITHIN THESE AREAS.
20. REMEDIATE ESTUARY SUB-AREAS E1, WL-22a, AND WL-22B.

GENERAL NOTES:

A. DEWATERING EFFLUENT FROM CONTAINMENT CELL GEOTUBES TO BE RETURNED TO A LOCATION IN BOAT HARBOUR WITHIN OR DOWNSTREAM OF THE ACTIVE DREDGING AREA.

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BOAT HARBOUR REMEDIATION

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Drawn	D. CORKILL	Designer	D. CORKILL
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Project No. **11148275**

Title
GENERAL STAGING 2 OF 4

Sheet No.
GG-G-05

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CONSTRUCTION SEQUENCING NOTES:

21. REMOVE BERM #6.
22. REMEDIATE BOAT HARBOUR SUB-AREA BH10 TO HIGH WATER MARK, INCLUDING IMPACTED WETLANDS WITHIN THIS AREA.
23. CONSTRUCT TEMPORARY BYPASS CAUSEWAY, REMOVE WATER LEVEL CONTROL STRUCTURE, REMOVE BERM #7, AND CONSTRUCT BRIDGE.
24. RESTORE WORK COMPOUND AREA. AGGREGATE TO BE HAULED OFF SITE FOR REUSE BY CONTRACTOR.
25. REMOVE BERM #5.
26. REMOVE BERM #4.
27. DECOMMISSION BOAT HARBOUR EFFLUENT TREATMENT FACILITY INFRASTRUCTURE AT POINT C. DISPOSE OF C&D WASTE OFF SITE.
28. REMOVE BERM #3.
29. REMOVE BERM #2.
30. DECOMMISSION BOAT HARBOUR EFFLUENT TREATMENT FACILITY INFRASTRUCTURE EAST OF SB. DISPOSE OF C&D WASTE OFF SITE.
31. FINAL REMEDIATION OF SB INCLUDING FILLING/GRADING WITH CLEAN FILL. RESTORE AREA.
32. CONSTRUCT TEMPORARY LEACHATE TREATMENT SYSTEM AND OPERATE.
33. DEMOBILIZE EQUIPMENT AND RESTORE AREA. AGGREGATE TO BE HAULED OFF SITE FOR REUSE BY CONTRACTOR.

GENERAL NOTES:

A. CONTAMINATED SOIL FROM BERMS #1-7 TO BE PLACED WITHIN CONTAINMENT CELL.
B. CLEAN FILL FROM BERMS #1-7 FOR USE ON SITE, INCLUDING FILLING THE SETTLING BASINS.

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Client
NS LANDS - BOAT HARBOUR
PICTOU LANDING, NOVA SCOTIA

Project
BOAT HARBOUR
REMEDIATION

No.	Issue	Drawn	Approved	Date
4	**PRE-TENDER DELIVERABLE**	DC	BS	05-21-2020
3	95% DESIGN REVIEW	DC	BS	03-12-2020
2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

Drawn	D. CORKILL	Designer	D. CORKILL
Drafting Check	B. SAMUELL	Design Check	B. SAMUELL
Project Manager	C. SKIRTH	Date	May 21, 2020
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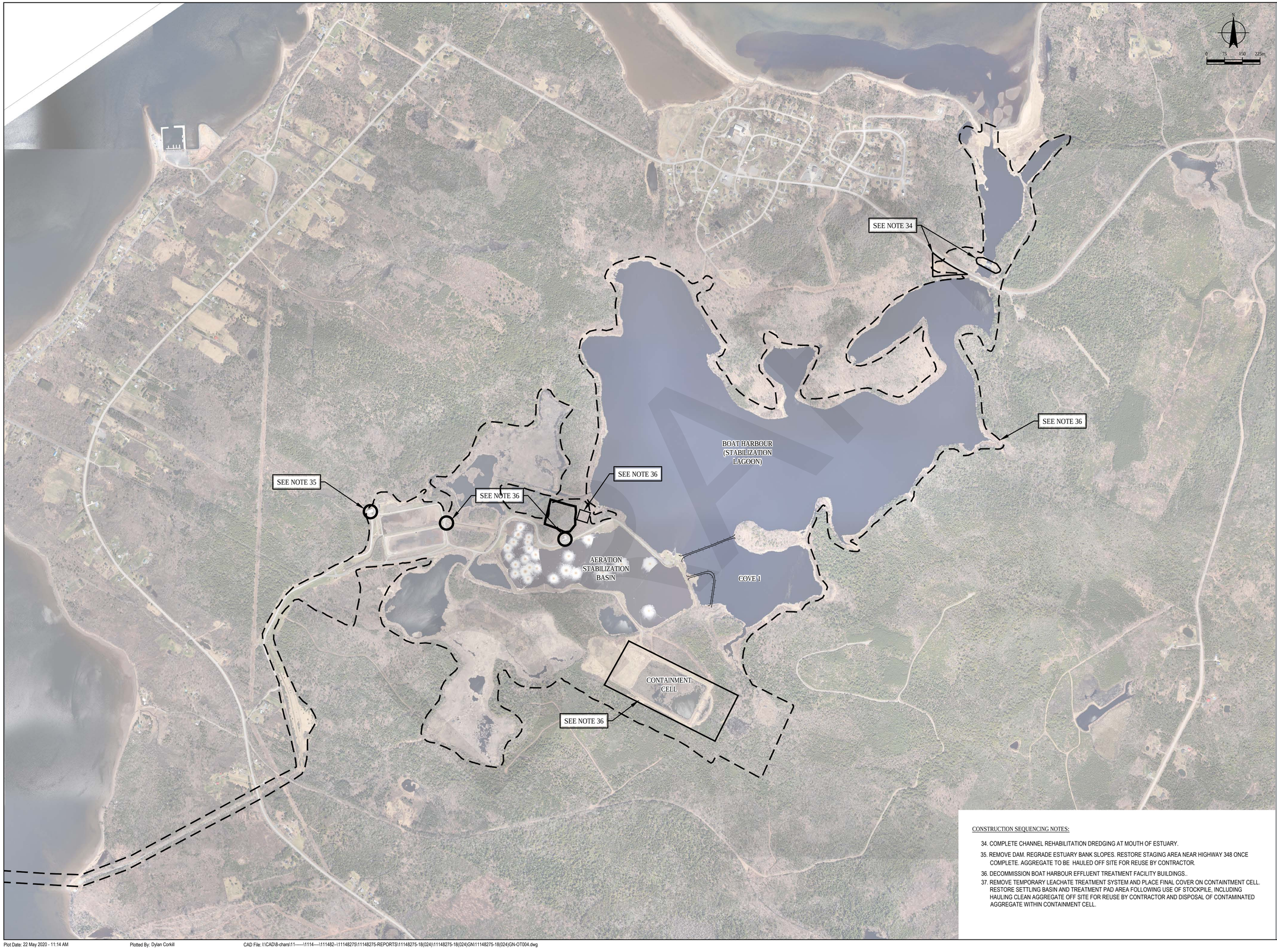
Project No. 11148275

Title
GENERAL STAGING
3 OF 4

Sheet No.
GG-G-06

Sheet of



CONSTRUCTION SEQUENCING NOTES:

34. COMPLETE CHANNEL REHABILITATION DREDGING AT MOUTH OF ESTUARY.
35. REMOVE DAM. REGRADE ESTUARY BANK SLOPES. RESTORE STAGING AREA NEAR HIGHWAY 348 ONCE COMPLETE. AGGREGATE TO BE HAULED OFF SITE FOR REUSE BY CONTRACTOR.
36. DECOMMISSION BOAT HARBOUR EFFLUENT TREATMENT FACILITY BUILDINGS..
37. REMOVE TEMPORARY LEACHATE TREATMENT SYSTEM AND PLACE FINAL COVER ON CONTAINTMENT CELL. RESTORE SETTLING BASIN AND TREATMENT PAD AREA FOLLOWING USE OF STOCKPILE, INCLUDING HAULING CLEAN AGGREGATE OFF SITE FOR REUSE BY CONTRACTOR AND DISPOSAL OF CONTAMINATED AGGREGATE WITHIN CONTAINMENT CELL.

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PICTOU LANDING, NOVA SCOTIA

Project
BOAT HARBOUR
REMEDIATION

No.	Issue	Drawn	Approved	Date
4	**PRE-TENDER DELIVERABLE**	DC	BS	05-21-2020
3	95% DESIGN REVIEW	DC	BS	03-12-2020
2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

Drawn	D. CORKILL	Designer	D. CORKILL
Drafting Check	B. SAMUELL	Design Check	B. SAMUELL
Project Manager	C. SKIRTH	Date	May 21, 2020
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Title
GENERAL STAGING
4 OF 4

Sheet No.
GG-G-07

Sheet of

LEGEND

PROPERTY BOUNDARY

FENCELINE

TREELINE

SHORELINE

WETLAND AREAS

BOAT HARBOUR
LAGOON

PREFABRICATED
TRUSS BRIDGE

SITE ACCESS
ROAD

SITE ACCESS
ROAD

CONTAINMENT CELL
AND LEACHATE FILL
STATION

CHAINLINK
PERIMETER FENCE

WIRE
DEMARCATION
FENCING

SURFACE
WATER POND

N

0 30 60 90m

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PICTOU LANDING, NOVA SCOTIA

Project
BOAT HARBOUR
REMEDIATION

No.	Issue	Drawn	Approved	Date
2	PRE-TENDER DELIVERABLE	DC	BS	05-21-2020
1	95% DESIGN REVIEW	DC	BS	03-12-2020

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Project No. 11148275

Title
FINAL
CONDITIONS

Sheet No.
GG-G-08

Sheet of

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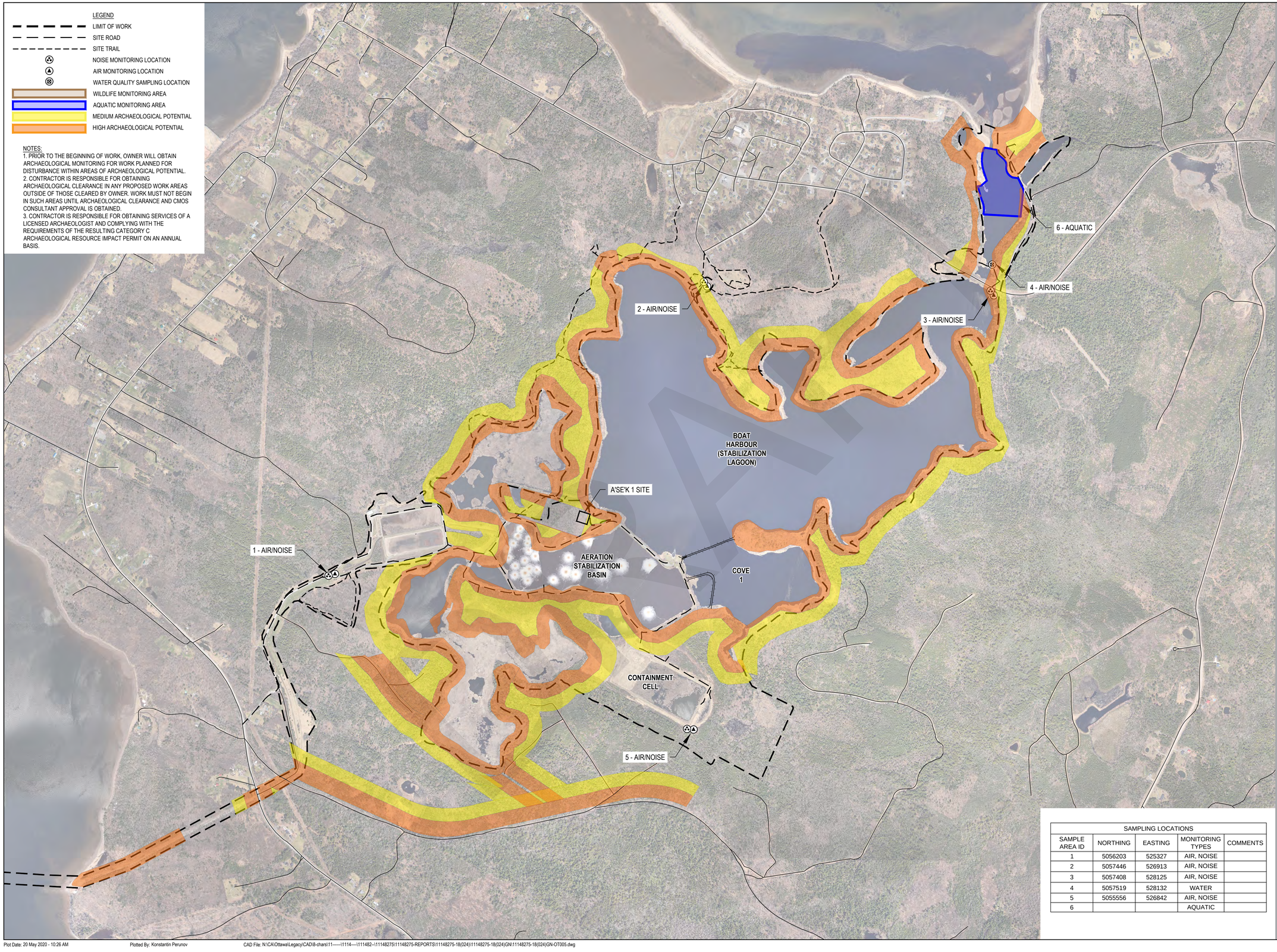

SAMPLING LOCATIONS				
SAMPLE AREA ID	NORTHING	EASTING	MONITORING TYPES	COMMENTS
1	5056203	525327	AIR, NOISE	
2	5057446	526913	AIR, NOISE	
3	5057408	528125	AIR, NOISE	
4	5057519	528132	WATER	
5	5055556	526842	AIR, NOISE	
6			AQUATIC	

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N
0 75 150 225m

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Project
BOAT HARBOUR REMEDIATION

No.	Issue	Drawn	Approved	Date
4	PRE-TENDER DELIVERABLE	DC	BS	05-21-2020
3	95% DESIGN REVIEW	DC	BS	03-12-2020
2	50% DESIGN REVIEW	DC	BS	12-20-2019
1	30% DESIGN REVIEW	DC	BS	10-18-2019

Drawn	D. CORKILL	Designer	D. CORKILL
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Project Manager	C. SKIRTH	Date	May 21, 2020
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Title
ENVIRONMENTAL MONITORING KEY PLAN

Sheet No.
GG-X-01

Sheet of

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DRAFT

Appendix F
Contingencies Plans
(PROVIDED BY CONTRACTOR)