Arctic Bay Harbour Development

Construction Environmental Management Plan

Public Services and Procurement Canada

PSPC No. R.110729.001

29 July 2021

317071-00037

Advisian
Worley Group

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Ikpiaryuk Services Ltd.

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Abbreviations and Acronyms

Acronym/abbreviation	Definition
ASPPR	Arctic Shipping Pollution Prevention Regulations
ARD	Acid rock drainage
ARDP	Archaeological Resource Discovery Plan
ATV	All-terrain vehicle
AWPPA	*Arctic Waters Pollution Prevention Act*
BMPs	Best Management Practices
CCG	Canadian Coast Guard
CCME	Canadian Council of Ministers of the Environment
CD	Chart datum
CEMP	Construction Environmental Management Plan
CCEMP	Contractor CEMP
CEPA	*Canadian Environmental Protection Act*
CMZ	Compliance monitoring zone
CNWA	*Canadian Navigable Waters Act*
cSEL	Cumulative sound exposure level
CSA	Canadian Standards Association
CSP	Construction Staging Plan
CWP	Construction Work Plans
CWS	Canadian Wildlife Service
DAS	Disposal at sea
DFO	Fisheries and Oceans Canada
DFO-SCH	DFO-Small Craft Harbours
DFO-FFHPP	DFO-Fish and Fish Habitat Protection Program
DG	Dangerous Good
ECCC	Environment and Climate Change Canada
ELC	Ecological land classification
EM	Environmental Monitor

Acronym/abbreviation	Definition
EZ	Exclusion Zone
FAA	Fisheries Act Authorization
FFHPP	Fish and Fish Habitat Protection Program
GN	Government of Nunavut
GN-CGS	GN-Community and Government Services
GN DoE	GN Department of Environment
GNWT	Government of Northwest Territories
HADD	Harmful alteration, disruption or destruction
HSERP	Health and Safety and Emergency Response Plan
HTA	Hunters and Trappers Association
HWL	High water line
IIBA	Inuit Impact and Benefit Agreement
IMDG	International Maritime Dangerous Goods Code
IMO	International Maritime Organization
INAC	Indigenous and Northern Affairs Canada
IOL	Inuit Owned Land
IQ	Inuit Qaujimajatuqangit
LUP	Land Use Permit
MBCA	*Migratory Bird Convention Act*
MCTS	Marine Communications and Traffic Services
MMMZ	Marine mammal monitoring zone
MMO	Marine Mammal Observer
MMR	Marine Mammal Regulations
MP	Monitoring Plan
MSP	Marine Safety Plan
NavCan	Nav Canada
NAVWARN	Navigational Warning
NBRLUP	North Baffin Regional Land Use Plan

Acronym/abbreviation	Definition
NIRB	Nunavut Impact Review Board
NOAA	National Oceanic Atmospheric Administration
NOTAM	Notice to Airmen
NPC	Nunavut Planning Commission
NRCan	Natural Resources Canada
NTUs	Nephelometric turbidity units
NuPPAA	*Nunavut Planning and Project Assessment Act*
NWNSRTA	*Nunavut Waters and Nunavut Surface Rights Tribunal Act*
NWB	Nunavut Water Board
OPPR	Oil Pollution Prevention Regulations
PPE	Personal Protective Equipment
PSIR	Project Specific Information Requirements
PSPC	Public Services and Procurement Canada
QAA	Quarry Administration Agreement
QARP	Quarry Abandonment and Restoration Plan
QEC	Qulliq Energy Corporation
QEP	Qualified Environmental Professional
QIA	Qikiqtani Inuit Association
QBMP	Quarry and Blasting Management Plan
RA	Regulatory Authority
RMS	Root-mean-square
SAP	Sample and Analysis Plan
SARA	*Species at Risk Act*
SCH	Small Craft Harbour
SCOPs	Standards and codes of practice
SDR	Screening Decision Report
SDS	Safety Data Sheets
SEC	Sediment and erosion control

Acronym/abbreviation	Definition
SEL	Sound exposure level
SPL	Sound pressure level
SPRP	Spill Prevention and Response Plan
TC	Transport Canada
The Project	Arctic Bay SCH
TI NMCA	Tallurutiup Imanga National Marine Conservation Area
TMP	Traffic Management Plan
VHF	Very high frequency
WQG	Water Quality Guidelines
WSCC	Workers Safety and Compensation Commission

1 Introduction

1.1 Project Overview

Fisheries and Oceans Canada – Small Craft Harbours (DFO-SCH) with support from Public Services and Procurement Canada (PSPC) is developing a small craft harbour (SCH) in the Hamlet of Arctic Bay on the northwest coast of Baffin Island, Nunavut (see Figure 1-1). The Arctic Bay SCH (the Project) is part of the Inuit Impact and Benefit Agreement (IIBA) (IIBA 2019) negotiated for the Tallurutiup Imanga (Lancaster Sound) National Marine Conservation Area (TI NMCA).

The Project will improve safety and access to water, functionality of boating activities, and reduce the congestion and environmental risks associated with the current use of the harbour. The permanent components of the Project include the construction of a new breakwater with fixed wharf, a boat launch ramp, small craft floating docks laydown area and lighting. The general layout of the SCH is presented in Figure 1-2. Temporary uses during construction include a quarry, haul road, and potentially a disposal at sea (DAS) site. Project components are further described in Section 3.

Worley Canada Services Ltd., operating as Advisian, and Ikpiaryuk Services Ltd. in joint venture, operating as Advisian-Ikpiaryuk JV, have been retained by PSPC to perform detailed design, community consultation support, regulatory support, and support services during construction for the Project.

Construction is anticipated to commence during the open-water season of 2022 and be completed within three years, prior to the iced-season of 2025. Construction of the Project is being managed by PSPC and DFO-SCH will own, operate, and maintain the SCH.

During construction, the Project will use the existing scheduled sealift deliveries and scheduled flights, with the potential for use of chartered flights when additional cargo or construction crew capacity is required. Fuel, potable water, sanitary and solid waste disposal are anticipated to be provided via existing facilities. Construction crew accommodations will be provided by a construction camp to be established by the construction contractor.

1.2 Purpose of the Plan

This document is the Project Construction Environmental Management Plan (CEMP). The purpose of this CEMP is to outline mitigation and monitoring measures to be implemented to minimize negative impacts to the physical, biological and socio-economic environment associated with construction activities. It identifies commitments made during consultation, best management practices (BMPs) and measures targeting the mandates of Regulatory Authorities (RAs). During construction, this CEMP will be replaced by a contractor CEMP (CCEMP). Minimum requirements for the CCEMP are described in Section 5.3.3.

1.3 Project Layout

The general layout of the SCH is presented in Figure 1-2. The new harbour will consist of a laydown area to the north and a large breakwater that wraps around the west and south to create a protected harbour. On the leeward side of the breakwater there will be a fixed wharf that includes a dredged berth pocket and approach channel allowing larger boats to access. An expanded laydown area will be located on the north side of the harbour entrance, adjacent to the existing sealift ramp. Initially, two strings of floating docks

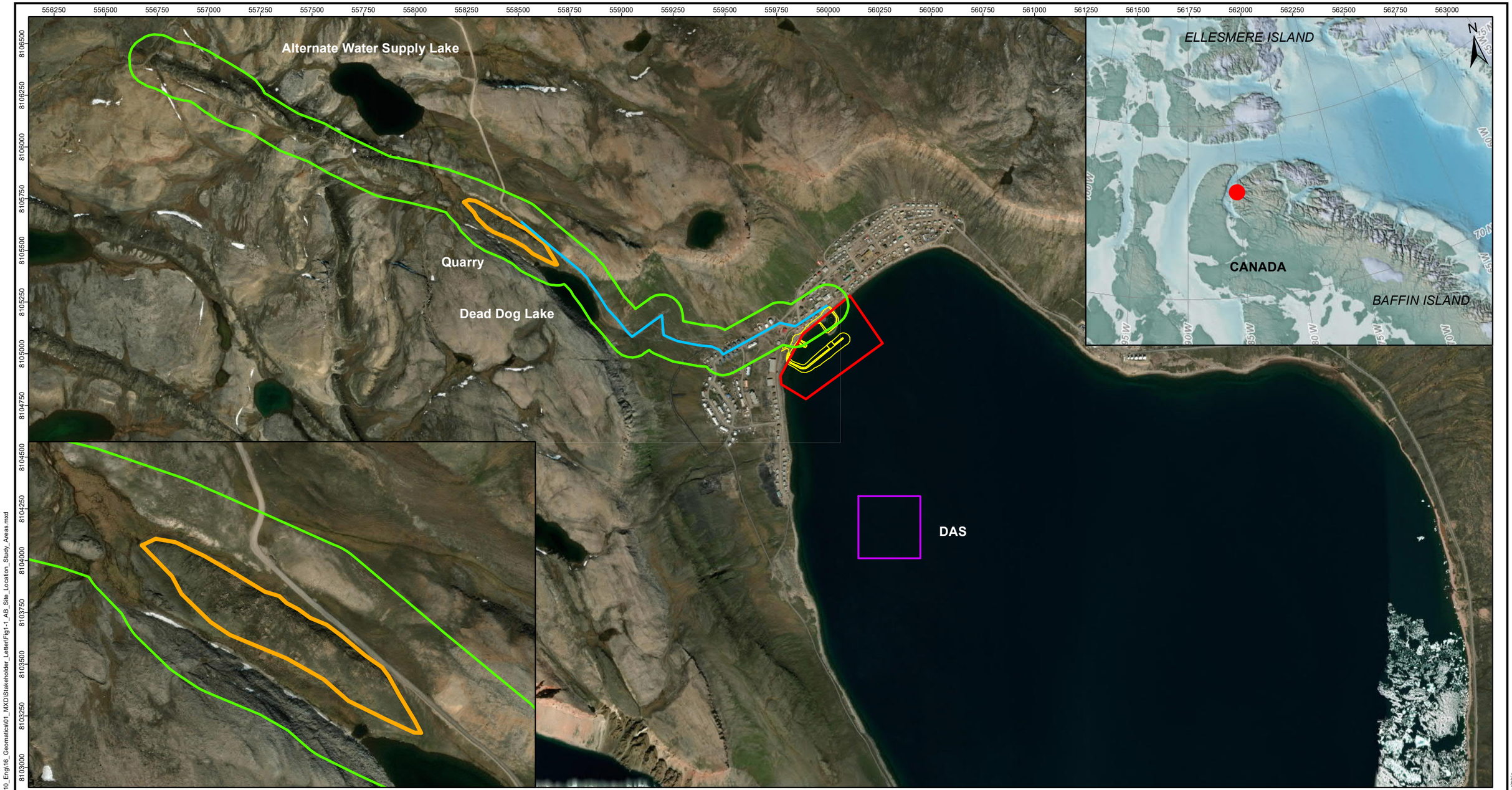
will be provided for the mooring of small vessels with room for future additional float strings. The area along the shoreline and under the floating docks will also be dredged to increase the water depth. At low water the harbour will have an overall area of approximately 2.2 hectares, which includes the area for the small craft floats. A boat launch ramp will be located along the shoreline approximately midway between the laydown area and the west portion of the breakwater.

The final arrangement of the SCH may change through the design development phase of the Project as DFO-SCH/PSPC plans to continue consulting with the community to refine the Project design. To support the construction of the SCH, the Project will require a new rock quarry. The location of the quarry and proposed haul road are presented in Figure 1-2. Details of the Project are presented in Section 3.

1.4 Consultation and Community Engagement

DFO-SCH and PSPC are conducting a comprehensive consultation program to confirm that the Project will serve the needs and priorities of the community including hunters, fishers, recreational users, residents, and businesses. Among the key objectives of the consultation program has been to collaborate with the community to identify potential Project effects and jointly develop suitable mitigation measures to minimize potential negative effects.

A detailed list of consultation events and feedback received to date is provided in the Community Consultation Log and summary report as provided in Advisian-Ikpiaryuk JV (2021a).



Legend

- Site Location
- SCH Footprint
- Haul Road (existing road to preferred quarry)

Study Areas

- SCH Study Area
- DAS Study Area
- Quarry Study Area
- Haul Road and Quarry (HRQ) Study Area

Project Study Area = HRQ + SCH Study Areas

0 200 400 800
Metres

1:18,000

WGS 1984 UTM Zone 16N

N

Locations approximate.

FISHERIES AND OCEANS CANADA
SMALL CRAFT HARBOURS
ARCTIC BAY

PROJECT STUDY AREAS AND LOCATION

Date: 25-JUN-21	Drawn by: KR	Edited by: KR	App'd by: VB
		Project No. 317071-00037	
		FIG No 1-1	REV 0

Advisian Ikpiaryuk Services Ltd.

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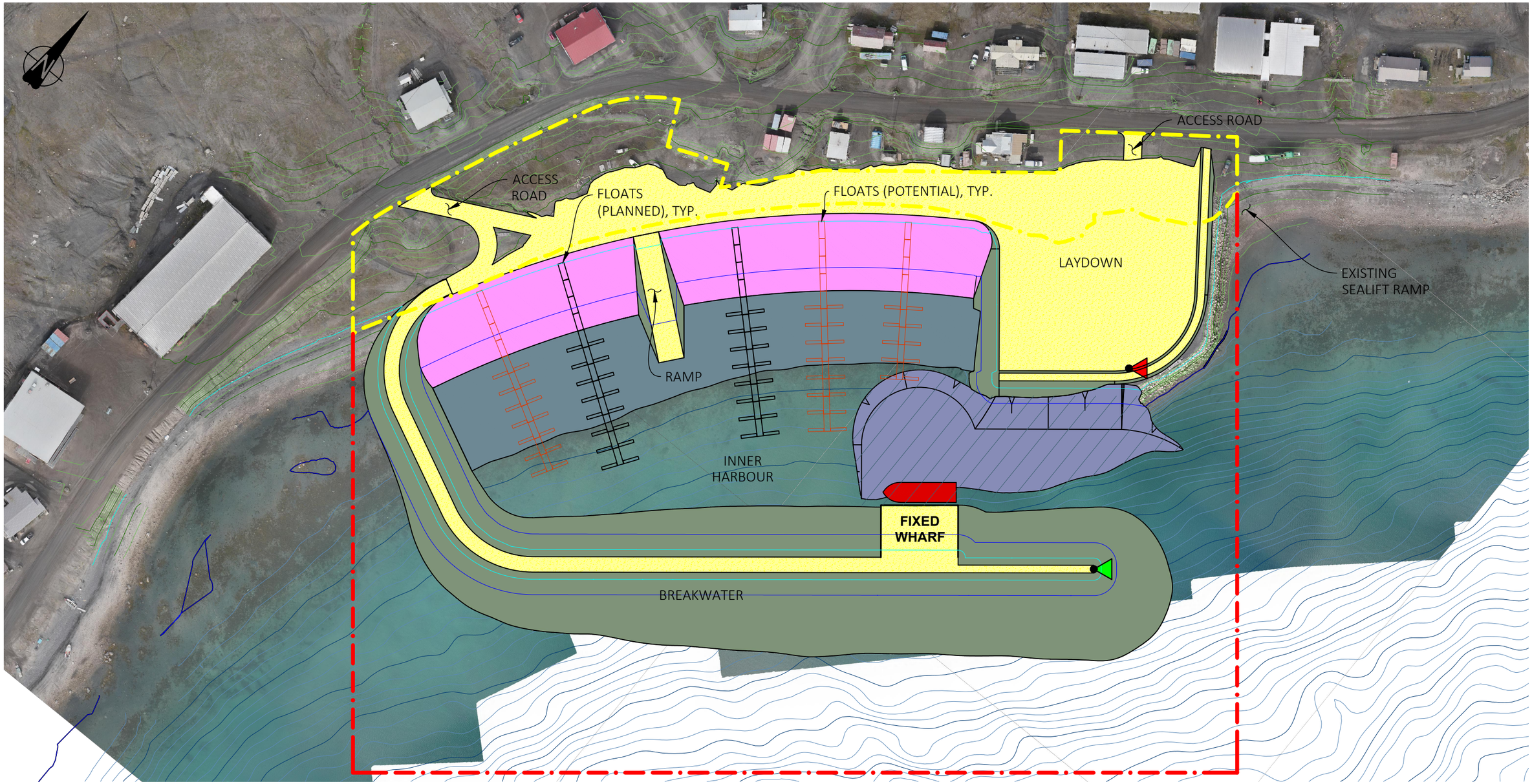
Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
NOAA Environmental Satellite, Data, & Information Service (NESDIS), National Geophysical Data Center (NGDC), IBCAO, GEBCO



LEGEND:

- BATHYMETRIC CONTOUR (1m INTERVALS)
- BATHYMETRIC CONTOUR (0.5m INTERVALS)
- TOPO CONTOUR (1m INTERVALS)
- TOPO CONTOUR (0.5m INTERVAL)
- GN-CGS LAND TRANSFER
- CIRNAC LAND TRANSFER
- GRAVEL - NON DRIVEABLE
- FILL OR CUT SIDE SLOPE
- GRAVEL - DRIVEABLE
- DREDGE -5m
- DREDGE -1.5m
- NAVIGATION LIGHT

PLAN

1:1500

m0 10 20 30 40 50 100m

1:1500

FISHERIES AND OCEANS CANADA
SMALL CRAFT HARBOURS
ARCTIC BAY

GENERAL ARRANGEMENT

Date:	Drawn by:	Edited by:	App'd by:
26-FEB-21	JLC	TJM	VBC

Worley Project No. 317071-00037

FIG No **1-2** REV **0**

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USER NAME: aaron.ledrum
ISSUING OFFICE: VANCOUVER, BC

2 Regulatory Framework

Construction and operation of the Project will require securing permits and approvals from: federal, territorial, and municipal governments; Inuit boards; and the Qikiqtani Inuit Association (QIA). The Project has engaged with RAs, Inuit boards and the QIA to confirm that relevant legislation (and regulations), policies, protocols and BMPs have been captured in the CEMP for compliance.

A summary of permits expected to be required for the Project is provided in Table 2-1, the majority of which will be held by DFO-SCH, although several will be the responsibility of the contractor.

2.1 Acts and Legislation

Legislation pertinent to compliance requirements for the Project as delineated by the Project effects are summarized in this section.

2.1.1 International

- International Maritime Dangerous Goods Code (IMDG), International Maritime Organization (IMO), 2020 (IMO 2020)

2.1.2 Federal

- *Arctic Waters Pollution Prevention Act* (AWPPA)
  - Part 4(1) states that: "*Except as authorized by regulations made under this section, no person or ship shall deposit or permit the deposit of waste of any type in the arctic waters or in any place on the mainland or islands of the Canadian arctic under any conditions where the waste or any other waste that results from the deposit of the waste may enter the arctic waters*"
  - Arctic Shipping Pollution Prevention Regulations (ASPPR), under AWPPA: to be referenced in relation to fuelling in the marine environment and ship owner's liability provisions regarding spillage of waste
- *Canada Navigable Waters Act* (CNWA)
  - Section 3 states that: "*Except in accordance in with this Act, it is prohibited to construct, place, alter, build, remove or decommission a work in, on, over, under, through, or across any navigable water*"
- *Canadian Environmental Protection Act*
  - Interprovincial Movement of Hazardous Waste Regulations
  - Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations
  - Disposal at Sea Regulations
- *Explosives Act*
- *Transportation of Dangerous Goods Act*
- *Canada Shipping Act*
  - Oil Pollution Prevention Regulations (OPPR)
  - Collision Regulations

- *Fisheries Act*
  - Section 34.4(1): No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.
  - Section 35(1): No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.
  - Section 36: Subject to subsection (4), no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water.
  - Marine Mammal Regulations (MMR)
  - Aquatic Invasive Species Regulations
    - Sections 6 to 10 prohibit any person to import, possess, transport, release, or introduce members of species set out in Part 2 of the schedule into or within areas detailed within the schedule, unless otherwise exempt as outlined within Sections 11 to 17.
- *Species at Risk Act* (SARA)
  - Section 2(1): wildlife species means a species, subspecies, variety or geographically or genetically distinct population of animal or plant.
  - Section 32(1): No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.
  - Section 33: No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.
  - Section 36(1): If a wildlife species that is not listed has been classified as an endangered species or a threatened species by a provincial or territorial minister, no person shall: (a) kill, harm, harass, capture or take an individual of that species that is on federal lands in the province or territory; (b) possess, collect, buy, sell or trade an individual of that species that is on federal lands in the province or territory, or any part or derivative of such an individual; or (c) damage or destroy the residence of one or more individuals of that species that is on federal lands in the province or territory.
  - Section 58(1) prohibits the damage or destruction of any part of designated critical habitat of a threatened, endangered, or extirpated species.
- *Migratory Birds Convention Act* (MBCA)
  - Migratory Birds Regulations
    - Section 6: Subject to subsection 5(9), no person shall (a) disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, or (b) have in his possession a live migratory bird, or a carcass, skin, nest or egg of a migratory bird except under authority of a permit therefor.

2.1.3 Territorial

- *Commissioner's Land Act*
  - Commissioner's Land Regulations
- *Environmental Protection Act*
  - Part 5 states that: "*Subject to subsection (3), no person shall discharge or permit the discharge of a contaminant into the environment…Unless the discharge is authorized by this Act or the regulations or by an order issued under this Act or the regulations*"
  - Spill Contingency Planning and Reporting Regulations (R-068-93)
- *Explosives Use Act*
- *Fire Safety Act*
- *Nunavut Lands Claim Agreement Act*:
  - Article 13 Part 7 states that: "*With the exception of domestic or emergency use of waters as set out in Section 5 of the Northern Inland Waters Act RSC 1985, c. N-25, no person may use water or dispose of waste into water without the approval of the Nunavut Water Board*"
- *Nunavut Agreement*
  - Section 33 in part states that: "*a permit holder shall not survey, investigate, excavate or alter an archaeological site without the consent of the title holder to the land*."
- *Nunavut Act*
  - Nunavut Archaeological and Palaeontological Sites Regulations:
    - Part 5(1) states that: "No person shall excavate, alter or otherwise disturb an archaeological site, or remove an archaeological artifact from an archaeological site, without a Class 2 permit."
- *Nunavut Planning and Project Assessment Act*
- *Nunavut Waters and Nunavut Surface Rights Tribunal Act*
  - Nunavut Water Regulations
- *Public Health Act*
- *Public Safety Act*
- *Transportation of Dangerous Goods Act*
- *Wildlife Act*
  - Section 90(1): No person shall intentionally feed a wild animal
  - Section 90(2): No person shall deposit or place in, on or about a place an attractant, if there is a reasonable likelihood that it would endanger a person, a wild animal or a domestic animal
  - Section 72(1): Unless lawfully harvesting eggs, no person shall injure, molest or destroy an egg of a bird
  - Section 72(2): Unless lawfully harvesting down, no person shall injure, molest or destroy (a) the nest of a bird when the nest is occupied by a bird or its eggs; or (b) the nest of any bird of prey or prescribed bird.

  - Section 73(1): No person shall, unless authorized by a licence, (a) engage in any activity, other than harvesting, that is likely to result in a significant disturbance to a substantial number of wildlife; or (b) break into, destroy or damage any abode of a bear, fox, beaver, muskrat, weasel, wolf or wolverine outside any municipality or prescribed area.
- *Territorial Land Act*
  - Territorial Land Use Regulations:
    - Part 16 states that: "If, in the course of a land use operation, a suspected historic or archaeological site or burial site is unearthed or otherwise discovered, the permittee shall immediately:
      - *(a) suspend the land use operation on the site*
      - *(b) notify the engineer or an inspector of the location of the site and the nature of any unearthed materials, structures or artifacts*"

2.1.4 Municipal

- By-Law 54 Land Administration

2.2 Permitting Requirements

Permitting requirements that are anticipated for the Project are summarized in Table 2-1.

Table 2-1 List of Potential Permitting Requirements for the Project

Regulatory/Authorizing Authority	Construction Activity	Required Authorization/ Permit/Approval	Permit Holder	Legislation
Inuit Boards				
Nunavut Planning Commission (NPC)	Development of land and water resources within Nunavut	Conformity Determination (149437)	Fisheries and Oceans Canada (DFO)-Small Craft Harbours (SCH)	*Nunavut Land Claims Agreement Act* (Nunavut Agreement, or NA) Article 11 *Nunavut Planning and Project Assessment Act* (NuPPAA) *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA) (*Nunavut Waters and Nunavut Surface Rights Tribunal Act* 2002) (*Nunavut Waters and Nunavut Surface Rights Tribunal Act* 2002) Nunavut Water Regulations. https://laws-lois.justice.gc.ca/eng/acts/N-28.75/page-2.html#h-370569
Territorial				
Nunavut Impact Review Board (NIRB)	Any development of land and water resources within Nunavut as determined by NPC's conformity determination	Screening Decision Report (SDR) (SDR not issued, Permit No. 21UN004)	DFO-SCH	NuPPAA https://laws-lois.justice.gc.ca/eng/acts/N-28.75/page-2.html#h-370569
Nunavut Water Board (NWB)	Potential for withdrawal of freshwater or the need to cross freshwater crossings for haul road construction	Type B Water Licence	contractor	*Nunavut Waters and Nunavut Surface Rights Tribunal Act*, Nunavut Water Regulations https://www.canlii.org/en/ca/laws/regu/sor-2013-69/latest/sor-2013-69.html
	Potential for diversion of small drainage ditch within SCH footprint	Type B Water Licence	DFO-SCH	
Government of Nunavut – Community and Government Services (GN-CGS)	Construction on Commissioners Land or Untitled Municipal Lands. Not expected to be required as the Quarry Administration Agreement (QAA) will be in place which allows the Hamlet to issue a quarry permit. However, if stockpiling occurs outside of the quarry area, the contractor may be required to obtain a Land Use Permit (LUP) from GN-CGS	LUP	contractor (if required)	*Commissioners Land Act* https://www.justice.gov.nt.ca/en/files/legislation/commissioners-land/commissioners-land.a.pdf Commissioners Land Regulations https://www.lands.gov.nt.ca/en/policies-and-legislation Hamlet of Arctic Bay Land Administration By-Law, Consolidation of Explosives Use Act https://laws-lois.justice.gc.ca/eng/acts/e-17/FullText.html
Federal				
Fisheries and Oceans Canada (DFO)	In water or near water works associated with the construction of the SCH that have the ability to result in the harmful alteration, disruption or destruction (HADD) of fish habitat or in the death of fish, as defined under the *Fisheries Act*. This will include potential effects to both marine and freshwater courses (if determined to be fish bearing, e.g. water crossings, blasting near water).	*Fisheries Act* Authorization (FAA)	DFO-SCH	*Fisheries Act* https://laws-lois.justice.gc.ca/PDF/F-14.pdf
Environment and Climate Change Canada (ECCC)	Disposal of dredged material at sea at an approved location.	Disposal at Sea (DAS) Permit	DFO-SCH	*Canada Environmental Protection Act* (CEPA): DAS Regulations http://laws-lois.justice.gc.ca/eng/acts/c-15.31/ http://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-275/
Transport Canada (TC)	In-water works associated with the construction and operations of the SCH that have the potential to interfere with navigation.	Approval	DFO-SCH	*Canadian Navigable Waters Act* (CNWA) http://laws-lois.justice.gc.ca/PDF/N-22.pdf

Regulatory/Authorizing Authority	Construction Activity	Required Authorization/ Permit/Approval	Permit Holder	Legislation
Natural Resources Canada (NRCan)	Blasting – For any industrial explosive that is to be imported into or manufactured, transported, possessed or used in Canada. Transport, storage and acquisition of explosives *it is assumed that the sealift company manages responsibility for permits for transportation of explosives	Authorization of Explosives Magazine Licence Application	contractor	*Explosives Act* (Section 7): Explosives Regulations (2013) Act: http://laws-lois.justice.gc.ca/PDF/E-17.pdf Regulation: http://laws.justice.gc.ca/PDF/SOR-2013-211.pdf
Designated Inuit Organization				
Qikiqtani Inuit Association (QIA)	Construction on Inuit Owned Land (IOL), which is currently not planned	Right of Way Agreement	contractor (if required)	*Nunavut Land Claims Agreement Act* (Nunavut Agreement, or NA) Article 11
Municipal				
Hamlet	Quarry use and operation	Quarry permit	contractor	*Nunavut Land Claims Agreement Act,* Article 14 (Planning and Lands Section)
	Use of explosives	LUP	contractor	Workers Safety and Compensation Commission (Workers' Safety and Compensation Commission (WSCC) | WSCC | Workers' Safety and Compensation Commission) Arctic Bay By-Law 54 Land Administration (CGS Planning & Lands - Community Plans and Zoning By-laws (cgs-pals.ca)

3 Construction Summary

The Project will include three primary components: the SCH, the quarry, and the existing haul road. The anticipated construction activities and methods are presented below. Construction support areas may be required which will include a contractor laydown area and potentially a construction camp (discussed in Section 3.3).

3.1 Project Description

The SCH will require construction of a new breakwater, a fixed wharf, boat launching ramp, laydown/storage area and floating docks that will be removed during the winter (see Figure 1-2). The existing breakwater will be incorporated into the new laydown/storage area. The Project will preserve the existing sealift ramp and adjacent sealift laydown areas. These components are further defined in Section 3 of the Project Specific Information Requirements (PSIR) document (Advisian-Ikpiaryuk JV 2021b). Construction activities associated with each Project component are summarized in Table 3-1.

Table 3-1 Summary of Construction Activities Associated with the Project

Small Craft Harbour	Quarry	Haul Road
Infill (laydown area, breakwater, boat ramp, shoreline, fixed wharf)	Drilling and Blasting	Upgrades to existing road
Pile driving	Crushing and Screening	Installation of culverts (potential)
Dredging	Stockpiling	Transportation of rocks
Disposal at Sea (potential)	Operation of equipment	Operation of equipment
Installation of small craft floats		
Stockpiling		
Operation of equipment		
Installation of culverts		

3.2 Construction Activities

The design and construction approach are based on the Arctic Bay Harbour Development Schematic Design report (Advisian-Ikpiaryuk JV 2021c). The design of the SCH will be finalized during the detailed design phase and the contractor will finalize the construction methods once onboard. The contractor may wish to complete some, generally non-disruptive, work at night. Such work extensions will be subject to consultation with the community and approval from the Hamlet.

This CEMP covers the main construction activities that will be required and provides appropriate mitigations.

Planned construction activities are detailed in Table 3-2.

Table 3-2 Planned Project Construction Activities

Activity	Description	Construction Approach
Small Craft Harbour		
Infill	• Infill material to be produced from the quarry. • Quarry operations will produce aggregates to be used for driving surfaces, subbases, filter rock, and construction of the inner core of the breakwater. • Armour Stone and large boulders will be supplied for rip rap and shoreline protection.	• Materials will be blasted and prepared as per specifications before being trucked to site. • Preparation of the material will depend on its intended purpose. • Quarry operations will include sorting and crushing of rock to produce smaller aggregates.
Laydown Area	• Fill material for the laydown area is expected to be dredged sediments.	• A containment berm will be constructed prior to dredging to allow for repurposing of the dredged material as fill. • The existing breakwater will be partially deconstructed, with the eastern portion retained as is. • Useable materials from the deconstructed breakwater will be repurposed to support construction of the containment berm. • During construction, breakwater materials will be sorted and placed to provide shoreline protection to the perimeter of the laydown arrangement. • Dredged sediments will be placed inside the berm; a crushed granular road structure will be placed on top to provide a suitable working surface.
Breakwater	• The 350 m breakwater will be comprised of a core of rock fill surrounded by rock armour. • The breakwater will stem from the shoreline for approximately 100 m before turning east and extending parallel to the shoreline, with a 6 m wide driving surface to allow for vehicle access along the first 300 m of its length.	• Dredge to remove soft sediments below the breakwater. • Dredgeate will be placed along the offshore edge of the toe of the breakwater to act as a ballast for improved stability of the breakwater. • The drivable section of the breakwater will be finished with crushed road surface.

Activity	Description	Construction Approach
Boat Ramp	• the 10 m wide boat ramp will be comprised of a core of rock fill. • The ramp is intended to allow for vessel launching at all tide levels with adequate space on shore for vehicle/trailer maneuverability.	• The boat ramp will be finished with a crushed road surface and sloped rip rap sides for erosion protection.
Shoreline	• The upland shoreline area will be graded for vehicle access. • Fill will be placed along the offshore edge of the shoreline and gently slope down to the water to create a landing pad for the floating docks.	• A crushed gravel driving surface will top the upland shoreline. • At the edge of the upland driving surface, fill will be placed and graded to create a 6H:1V slope with a coarse rock surfacing. It is intended to be a landing surface for the floats as they ground out at lower tides and not for vehicle access. It will not be topped with a gravel driving surface.
Fixed Wharf	• The approximately 40 m long fixed wharf will comprise of three 12.5 m diameter sheet pile cells. • Sheet piles will either be installed with marine- or land-based equipment as determined by the contractor. • The fixed wharf is designed for 30 m long vessels and is located approximately 60 m from the end of the lee side of the breakwater.	• The sheet pile cells will be filled with crushed rock. • Sheet piles will be installed either with a vibratory hammer or an impact hammer. • The wharf will be topped with a crushed road surfacing.
Area Lighting and Electrical	• Area lighting will illuminate the fixed wharf, laydown area, boat launch ramp, breakwater roadway and access road. • Navigation lights will be located at the harbour entrance, one on the laydown area and one on the breakwater. • Two power pedestals will be located on the fixed wharf providing power for boat operations.	• The lights and poles will be provided from Qulliq Energy Corporation (QEC). • The navigation lights will be mounted on standard CCG posts with concrete foundations. • Two galvanized steel frame power pedestals, mounted on precast concrete pad, will provide a 15 amp duplex, a 30 amp 120/240 V receptacle, and a 100 Amp 120/240 V receptacle.
Temporary Rock Platforms	• Should construction be land-based, temporary rock platforms may be required to support land-based equipment for work such as dredging and/or wharf construction. • Temporary rock platforms, if required, will likely be composed of gravel material and restricted to the dredge pocket footprints.	• The fill will be repurposed and will be used to complete the laydown area and other permanent components of the Project. • Temporary rock platform requirement, composition, and repurposed location will be a decision made by the contractor.

Activity	Description	Construction Approach
Dredging	• Dredging will be conducted at: – Below the breakwater. These will be repurposed as ballast on the seaward side of the breakwater. – The entrance of the 30 m access channel and 45 m turning circle, adjacent to the fixed wharf to an elevation of -5.0 m chart datum (CD). – Inner harbour, to an elevation of -1.5 m CD. – To slope the shoreline at 6H:1V.	• Dredging methodology will be confirmed by the contractor. Based on location and volume of dredging required, it is expected to be completed using conventional mechanical equipment, with materials dredged from the seabed, raised to the surface, and placed onto a scow or truck or placed in its final location. • Approximately 30,000 m^3 of sediments will be dredged: – Approximately 15,000 m^3 (20,000 m^2) of sediments will be dredged at the entrance channel and along the shoreline (see dredge footprint in Figure 1-2). – Approximately 15,000 m^3 (4,000 m^2) of sediments will be dredged in a region under the offshore slope of the breakwater. • Dredgeate will be repurposed as fill for permanent components of the Project, disposed of upland with approval from the Hamlet, or disposed of through DAS if necessary (to be permitted through ECCC).
Disposal at Sea (if required)	• A sediment Sample and Analysis Plan (SAP), should DAS be required, has been completed and approved by ECCC (Advisian-Ikpiaryuk JV 2020). • Should DAS be considered, an application for approval will be submitted to ECCC.	• The distance between the SCH and planned DAS site is 500 m (depicted in Figure 1-1). • If DAS is required, dredging/loading of material will be completed with marine-based equipment. • Dredged DAS sediments will have to be loaded directly into dump scows (typically 150–500 m^3 capacity) and towed to the DAS site using tugs. • The total number of trips required to complete DAS will be described to ECCC during the DAS application process.
Small craft floating docks	• Floating docks will as per the standard DFO-SCH design. • Two stringer floats, each 2.4 m wide and 80 m long, each able to accommodate 32 vessels. • The fingers will be 1.2 m wide and 6 m long for local community vessels. • The harbour has space to add three additional finger floats, each with capacities of 32, 28, and 20 vessels.	• Floating docks will be secured with a chain anchoring system using concrete anchor blocks on the seabed. • The floating docks are not intended to be left in place over winter; and will be removed prior to freeze up and stored above high water, to be redeployed the next summer following breakup and clearing of the harbour.

Activity	Description	Construction Approach
Drainage ditch diversion	• Six culverts currently drain into the existing harbour. A series of ditches along the inshore side of the property and culverts at roadways will divert run off and discharge it outside of the new SCH.	• Ditches will be excavated and armoured with rock. • Culverts will be installed at road crossings.
Operation of equipment	• Equipment expected to be required for the construction of the SCH is summarized in Section 3.6. • Equipment will arrive in Arctic Bay either by sealift, or, if marine-based construction is undertaken, may be transported by the contractor.	--
Quarry		
Drilling and blasting	• Drilling and blasting will be conducted at the quarry to support all required infill activity. The quarry is immediately adjacent to the road to Victor Bay and to Dead Dog Lake and upstream of the Alternate Water Supply Lake (see Figure 1-1). Appropriate measures will be in place for the protection of fish and safety of community members using the road.	• Approximately 90,000 m^3 of bedrock is required to be blasted for the SCH. • The quarry will be worked from the north end and fly rock will be directed to the north, away from Dead Dog Lake. • The blasted rock will be sorted, crushed, screened, and stockpiled to produce various products. • Appropriate measures will be implemented to confirm sediment and erosion control (SEC) measures will be in place to protect the nearby Dead Dog Lake and Alternate Water Supply Lake. • Should local drainage be altered as part of the quarry development, DFO-SCH will work with the contractor's confirm appropriate information is obtained for the submission of the NWB permit.
Crushing and screening	• Crushing and screening at the quarry of the blasted rock will be required to produce general fill, rip rap, and various granular crushed products.	• Run of quarry will be put through a rock crusher and screened to produce the aggregate gradations required.
Stockpiling	• Stockpiling of aggregates will be required and will primarily be at the quarry. Some stockpiling may occur at the SCH.	• Armour stones and aggregates will be piled and stored at the quarry prior to being trucked to the construction site.

Activity	Description	Construction Approach
Haul road		
Haul road	• The existing road between Arctic Bay and Victor Bay will be used to haul aggregates from the quarry to the SCH. • The length of road used for hauling operations will be approximately 2 km and will be maintained throughout the project.	• The existing road alignment had two tight turns that will require widening to ease the turn for large trucks. • Additional widening, in the form of pull outs, will be located at several sections along the road to allow for haul trucks and local traffic to pass each other. • If required, the contractor will be responsible for installation of culverts

3.3 Construction Support Areas

3.3.1 Contractor Laydown Area

Construction materials and equipment for the Project will be stored in a construction laydown area. Although the laydown area will be left to the contractor to coordinate with the Hamlet, it is expected that the gravel pad located on the east side of the tank farm at the industrial site will be main location for storage, equipment maintenance facilities and vehicle parking (see Figure 2-2 in the PSIR report for location).

3.3.2 Construction Camp

A construction camp may be required by the contractor to accommodate non-local project personnel. The location of the construction camp will be coordinated with the Hamlet and will be located within municipal boundaries. If additional permits are required (e.g. NWB) in relation to the construction camp, this will be the responsibility of the contractor.

3.4 Schedule

Construction is anticipated to be completed over three years, starting in 2022, and is expected to be operational in the open-water season of 2025. The anticipated schedule for the SCH construction is provided in Table 3-3. The majority of the construction is expected to be completed in open-water seasons, which for Arctic Bay is approximately from early July to late October (approximately 120 days).

Table 3-3 Anticipated Schedule for the Project

Task	Timeline
Pre-Construction	
• Permitting, Baseline Surveys and Consultations	August 2020 to January 2022
• Schematic Design	August 2020 to January 2021
• Geotechnical Investigations	Spring 2021
• Detailed Design and Construction Documents Preparation	February 2021 to September 2021
• Permitting Complete	December 2021
• Construction Tender	Early 2022
• Award of Construction Contract	April 2022
Construction	
• Mobilization of equipment and supplies • Set up construction camp and equipment maintenance facilities, as required • Prepare quarry and commence blasting for aggregate production and stockpile pads. • Set up crusher and complete test runs.	2022 Construction season

Task	Timeline
• Commence placement of breakwater core.	
• Aggregate production • Breakwater core and armour placement • Wharf construction including topsides • Dredging and onshore disposal • Partial demobilization	2023 Construction season
• Complete breakwater armour surfacing. • SCH floats, including installation and removal demonstration • Final grading and compaction • Electrical installations • Remainder of demobilization	2024 Construction season
Operations	
• Harbour operations	September 2025

3.5 Transportation (Mobilization and Demobilization)

Mobilization to site will commence with the sealift in 2022, which typically arrives in Arctic Bay at the end of August or early September. For the first year of construction, mobilization will include equipment, mainly for quarrying and earthworks, camp/accommodation modules and miscellaneous construction consumables. At the end of the construction seasons the site will be prepped for overwintering and the main construction equipment is expected to remain on site. Planning must take into consideration the timing of the sealifts and the materials and equipment that will be needed for the upcoming construction seasons. As tasks are completed and equipment is no longer needed equipment will be demobilized from site and returned to the south via sealift.

3.6 Equipment

The anticipated construction equipment for the Project is as outlined in Table 3-4. The contractor will decide if marine equipment is needed.

Table 3-4 Anticipated Construction Equipment

Equipment Type and Number	Size	Use
Drills – 2 to 3	5 tons	Quarrying
Excavators – 3 to 4	30 to 40 ton	Quarrying, handling armour stone, loading trucks, excavating
Trucks – 4 to 5	35 to 40 ton articulating	Hauling quarried rock
Transport Trucks	Heavy Duty (off-road capable tractor and trailer) (40 tons)	Moving materials and equipment onsite

Equipment Type and Number	Size	Use
Front end loader – 2 to 3	966 to 988	Loading rock and moving cargo/equipment
Compactor – 1	20 ton	Compacting road surfacing
Dozer – 1	D8	placing rock and road surfaces
Grader – 1	140	Road maintenance, final grading
Spud barge/derrick– 1	20 m x 50 m deck w/ 150 ton to 250 ton crane	Dredging, sheet pile installation, moving/lifting materials and equipment
Dump scows – 2 to 3	150 to 500 cubic metre	Dredging and DAS
Tug – 1	1,000 – 1,500 horsepower	Mobilization and floating equipment movement
Work boats – 1 to 2	Varies, 50 to 500 horsepower	Floating equipment movement
Pickup trucks – 5	Crew cab, ¾ ton	Crew and supplies movement
Mini-bus – 1	15 passenger	Daily crew mobilization from accommodation to Project site
Fuel/service truck – 1	10 ton	Daily refueling and servicing of major mobile equipment, fueled from Government of Nunavut (GN) - Petroleum Products Division dispensers in Arctic Bay.
Water truck – 1	10 ton	Construction, dust suppression, and miscellaneous water
Telehandler – 1	5 ton	Moving materials and equipment
Rough terrain crane – 1	80 ton	Lifting materials
Vibratory/Impact Hammer – 1	---	Installing sheet piles
Rock Crusher – 1	---	Crushing run of quarry materials

3.7 Site Preparation and Staging

For site mobilization, materials will be shipped to the Project site and a contractor laydown area will be established to store materials and equipment. Services to support the Project activities and personnel, including water use, waste management and accommodations, will be established. Further details on site preparation and staging are in Section 2.6 of the PSIR.

3.8 Operations

Operation of the Project is expected to begin in the open-water season of 2025 and will be defined by the Operations Plan which will be developed by DFO-SCH in collaboration with the local harbour committee that will be set up as the interface between DFO-SCH and the users. This will be a public facility for the community and will not have access restrictions. Generally, the SCH operations will be similar to current, with improvements to vessel moorage, wave and wind protection, boat launching and storage.

3.9 Maintenance

The SCH is expected to have a realistic lifespan of 100+ years with individual components based on service lives from 40 to 75 years, except for the floats which have reduced design life. However, the service life does not imply that maintenance on the structure will not be required during that period. Periodic inspections and maintenance will be required and will be described in the Operations Plan. Maintenance activities expected to include:

- Regular inspections of the harbour components to confirm what, if any, maintenance is required, either short term (same year) or long term (can be deferred or requires the following sealift) but is expected to include the following.
  - Re-grading/compaction of the road surfaces and laydown areas.
  - Re-grading/compaction of the boat launching ramp.
  - Periodic replacement of float components, including chains, hinges, sleepers and deck.
  - Periodic re-dressing of riprap surface where rocks may have been plucked by ice.
  - Maintenance of harbour lighting in coordination with QEC.
- Spring clearing of culvert inlets and outlets of drifted snow.
- Deployment of the floating docks. It is expected the floating docks will be stored on the laydown area or the shoreline adjacent the launch ramp during the winter months.
- Periodic sounding surveys to confirm there are no locations of accumulating sediments or boulders deposited by shifting ice.

3.10 Decommissioning

The SCH is considered a permanent structure with no plans for decommissioning.

4 Potential Environmental and Socio-Economic Effects

Construction activities with the potential to have impacts on the physical, biological and socio-economic environment are listed in Table 3-1. Potential impacts were identified and assessed using the existing conditions data, which was collected through desktop review, field surveys and consultation. Categorization of the impacts was undertaken using the NIRB guidance and template table (see Table 4-1) as follows:

- Positive – P
- No impact – blank cell
- Negative and mitigatable – M
- Negative and non-mitigatable – N
- Unknown – U

Potential impacts were identified, assessed and categorized as per NIRB requirements, but will be pertinent to all RAs. More details on the impacts assessment can be found in the PSIR Report (Advisian-Ikpiaryuk JV 2021b).

Table 4-1 Environmental Impacts Table

NIRB Nunavut Impact Review Board / Nunavutmi Kanoglivalianikot Elittohaiyeoplotik Katimayiit	**Physical**	Designated Environmental Areas	Geological Site Conditions	Surface Features	Ground Stability and Permafrost	Hydrology	Air Quality	Noise	Climate Conditions	Marine Sediment and Water Quality	Coastal Morphology and Bathymetry	Tides and Currents	**Biological**	Vegetation (Terrestrial)	Wildlife	Birds (Migratory and Marine)	Marine Fish Habitat	Fish and Marine Mammals	Species at Risk	**Socio-Economic**	Employment, training and business opportunities	Land and resource use	Tourism	Local and regional traffic patterns	Community Health and Wellness	Community Infrastructure and services	Archaeological and culturally significant sites
Construction																											
Infill							**M**	**M**		**M**	**M**			**M**	**M**	**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Dredging							**M**	**M**		**M**	**M**					**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Disposal at Sea							**M**	**M**		**M**					**M**	**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Pile driving							**M**	**M**		**M**					**M**	**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Installation of Floating docks							**M**	**M**								**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Drilling and Blasting							**M**	**M**							**M**	**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Crushing and Screening							**M**	**M**							**M**	**M**		**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Stockpiling																		**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Haul Road Upgrades														**M**	**M**	**M**			**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Drainage for quarry or haul roads (culverts)					**M**										**M**	**M**	**M**				**P**	**M**	**M**	**M**	**M**	**M**	
Mobilization/Demobilization of equipment							**M**	**M**						**M**					**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Construction equipment (marine, land based)							**M**	**M**						**M**	**M**	**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Light (illumination of Project site)														**M**	**M**	**M**		**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Fuel storage, refueling, accidental spills							**M**	**M**		**M**				**M**	**M**	**M**	**M**	**M**	**M**		**P**	**M**	**M**	**M**	**M**	**M**	
Construction workforce							**M**	**M**													**P**	**M**	**M**	**M**	**M**	**M**	
Operation																											
Marine Access							**M**	**M**													**P**	**P**	**P**	**P**	**P**	**P**	
Road Access							**M**	**M**							**M**	**M**											

NIRB Nunavut Impact Review Board	**Physical**	Designated Environmental Areas	Geological Site Conditions	Surface Features	Ground Stability and Permafrost	Hydrology	Air Quality	Noise	Climate Conditions	Marine Sediment and Water Quality	Coastal Morphology and Bathymetry	Tides and Currents	**Biological**	Vegetation (Terrestrial)	Wildlife	Birds (Migratory and Marine)	Marine Fish Habitat	Fish and Marine Mammals	Species at Risk	**Socio-Economic**	Employment, training and business opportunities	Land and resource use	Tourism	Local and regional traffic patterns	Community Health and Wellness	Community Infrastructure and services	Archaeological and culturally significant sites
Fuel storage, refueling, accidental spills							**M**	**M**						**M**	**M**	**M**											
Cargo delivery (sealift operations)																					**P**	**P**	**P**	**P**	**P**	**P**	
Boat launching																					**P**	**P**	**P**	**P**	**P**	**P**	
Decommissioning																											
Not applicable.																											

Notes:

P = Positive	Net gain in functionality after construction or during operations
N = Negative, non-mitigatable	Negative and will remain as a residual effect, after construction or during operations
M = Negative, mitigatable	Negative, but measures can be put in place to minimize or eliminate the effect
U = Unknown	Information is not available to confirm what effects will be
Blank = No impact	There is a no effect, and thus considered neutral

5 Environmental Management

This section outlines BMPs and the minimum mitigation and monitoring measures required to be implemented during construction. Communication and reporting commitments are outlined as well as roles and responsibilities.

5.1 Best Management Practices and Guidance Documents

Guidelines and BMPs that will be incorporated into the CEMP and into the contractor Construction Work Plans (CWPs) include:

- DFO: Fish and Fish Habitat Protection Policy statement (DFO 2019a)
- DFO: Measures to Protect Fish and Fish Habitat (DFO 2019c)
- DFO: Standards and Codes of Practice (DFO 2019b)
- DFO: Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat (DFO 2013)
- DFO: Projects Near Water - Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat (DFO 2019d)
- DFO: Guidelines for the Use of Explosives in or Near Canadian Water (Wright & Hopky 1998)
- Best Management Practices for Pile Driving and Related Operations (BC Marine and Pile Driving Contractors Association 2003)
- National Oceanic Atmospheric Administration (NOAA): 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (NOAA 2018)
- Environmental Protection Service, and Environmental Guideline for Dust Suppression (GN 2002).
- Government of Canada: General nesting periods of migratory birds (Government of Canada 2018a)
- Government of Canada: Guidelines to reduce risk to migratory birds (Government of Canada 2019b)
- Government of Canada: Guidelines to avoid disturbance to seabird and waterbird colonies in Canada (Government of Canada 2018b)
- Government of Nunavut: Non-native and invasive species in Nunavut (Government of Nunavut 2011)
- Government of Nunavut: Contingency Planning and Spill Reporting in Nunavut. A Guide to the New Regulations (Government of Nunavut 2003)
- Indigenous and Northern Affairs Canada (INAC): Guidelines for Spill Contingency Planning (INAC 2008)
- ECCC: Guidelines for the Preparation of Hazardous Material Spill Contingency Plans (ECCC 1990)
- Emergency and continuity management program, Canadian Standards Association (CSA) Z1600-14, 2014 (CSA 2014)
- TC: National Oil Spill Preparedness and Response Regime (Transport Canada 2019)
- Canadian Construction Association: A Best Practices Guide to Solid Waste Reduction (Canadian Construction Association 2001)

- Government of Nunavut, Department of Environment (GN DoE):
  - Environmental Guideline for the General Management of Hazardous Waste (GN DoE 1999)
  - Environmental Guideline for Used Oil and Waste Fuel (GN DoE 2012)
  - Environmental Guidelines for Industrial Waste Discharges into Municipal Waste and Sewage Treatment Facilities (GN DoE 2011)
- Government of Northwest Territories (GNWT):
  - Northern Land use Guidelines, Pits and Quarries (GNWT 2015b)
  - Northern Land Use Guidelines, Access: Roads and Trails (GNWT 2015a)
- NIRB: Abandonment and Restoration Plan (NIRB 2021)
- National Research Council Canada: National Fire Code of Canada, 2015 (National Research Council Canada 2015)
- Workplace Hazardous Materials Information System (WHMIS) (Health Canada 2020)

5.2 Roles and Responsibilities

The requirements to meet regulatory commitments, will be undertaken by DFO-SCH, the Construction Administration Team, and the contractor's team. The roles and responsibilities for each team with respect to management of environmental performance on the Project are set out below. The responsibility for the application of this CEMP encompasses all Project personnel from management to construction workers.

5.2.1 Fisheries and Oceans Canada – Small Craft Harbour / Public Services and Procurement

DFO-SCH/PSPC will undertake the following responsibilities to manage regulatory compliance:

- Communicating with RAs on matters related to permitting and regulatory compliance.
- Continued consultation with the community and Hamlet.
- Reviewing and approving the CCEMP.
- Reviewing and approving CWPs.
- Coordination with the contractor to manage and communicate on compliance issues.
- Transmitting monitoring reports and incident notices to regulators, community members and groups, as necessary.

5.2.2 Construction Administration Team

The Construction Administration Team will act on behalf of and report to DFO-SCH/PSPC, whose roles will be defined prior to construction. A summary of the roles is below:

- Support to the DFO-SCH/PSPC responsibilities summarized above.
- Verifying that the contractor's activities comply with contractual requirements and the approved design, including environmental requirements, regulations and relevant permits and approvals.

- Reviewing the qualifications of Environmental Monitors (EMs) presented by the contractor to confirm on-site personnel are appropriately qualified.

5.2.3 Contractor Team

The contractor is responsible for the management of construction activities and the preparation of CWPs (see Section 5.3) for approval by DFO-SCH/PSPC.

The contractor will retain a Qualified Environmental Professional (QEP) as the EM to provide the following services:

- Assist with the preparation of CWPs in advance of construction, with updates as required for changes in methodology, legislative requirements, or due to adaptive management.
- Onsite EM services to confirm that land and marine-based construction are appropriately monitored.
- Conduct field inspections, taking necessary environmental samples to confirm compliance with the CCEMP and other relevant CWPs, for all contractor works.
- Record monitoring results, environmental compliance, and corrective actions.
- Prepare routine and incident reporting to DFO-SCH/PSPC.
- Instruct crews to suspend construction activities that do not accord with standards included in this CEMP, associated CWPs, or following an Environmental Incident.
- Communicate with all contractor personnel and provide training on environmental compliance requirements.
- Coordinate with the contractor's staff, including all sub-contractors, to confirm compliance with the CEMP and CWPs; government regulatory, approval and permit conditions, procedures, and field instructions from the Construction Administration Team.
- Lead training and awareness: promotion of environmental protection by contractor's staff, including the implementation of best management practices and procedures.
- Manage a data management system to securely store, manage, and transfer raw data collected during EM requirements (e.g. acoustic files, turbidity files) to DFO-SCH/PSPC.

5.3 Construction Work Plans

Prior to construction, the contractor will be responsible for submitting a construction method statement which describes the phases for mobilization, preparation, execution, site clean up, and restoration and demobilization.

In addition to method statements covering the execution of specific tasks, CWPs will be developed as described in Section 5.3.1 through 5.3.7.

5.3.1 Marine Safety Plan

The Marine Safety Plan (MSP) is intended to minimize traffic interferences for the community and confirm that Inuit harvesting rights are not impacted. It is also to confirm that mitigation measures are being undertaken for the as per the TC approval to minimize navigational interferences.

The MSP will be developed by the contractor to identify plans for marine communication requirements, in addition to confirming access to foreshore and harbour functionality is maintained. The MSP will at a minimum identify the following:

- Location of marine navigational markers that are required as stipulated in the TC Approval.
- Location of marine construction buoys that are required to safely identify navigational exclusion zones.
- Transportation route for equipment and materials to transit along the foreshore.
- Communication plan for the following:
  - Notifying local mariners and residents on marine access protocols during construction including directions and navigational exclusion zones, and how residents will be notified should their equipment need to be moved to support construction.
  - On-site contact details for how mariners can contact the contractor regarding marine access protocols.
  - Communication requirements for compliance with the CNWA (e.g. Navigational warnings [NAVWARNs]).
- Description of temporary structures required to support construction.
- Designated locations where boats may be launched, beached, and accessed through construction.

5.3.2 Traffic Management Plan

The TMP will describe measures to be implemented to manage site access, traffic through the community and inform the community of ongoing construction traffic safety concerns. The TMP will confirm how land-based transportation will be undertaken to safely move between the quarry and SCH. The TMP will at a minimum include the following:

- Identify traffic routing between the quarry and the SCH.
- Locations and layout of contractor laydown areas.
- Diagrams to depict appropriate marking/flagging of the laydown areas for both safety and confirmation of boundaries to minimize footprint.
- Dust management plan for the haul road.
- Information on speed limits to be obeyed by construction personnel.
- Driver training and safety awareness.
- Regular vehicle maintenance.
- Adequate lighting on vehicles so they can be easily seen.
- Traffic control measures at busy intersections along the haul route.
- Traffic awareness campaign concerning road safety, particularly for children and teens (e.g. traffic safety and awareness talks in local schools and public events/community centres, posters distributed and posted around town, radio shows).
- Management of road closures and exclusion area during blasting (road closures daily for ~30 mins, at the same time every day).
- Notification procedures for daily road closures due to blasting.

- Details on how construction crew will be transported from the contractor's construction camp to the construction sites.
- An appropriate inspection and maintenance program in place for construction equipment and vehicles, including brake checks.

5.3.3 Contractor Construction Environmental Management Plan

A CCEMP will be developed by the contractor to describe how mitigation measures presented within this CEMP will be implemented during construction. At a minimum, the CCEMP will detail the following:

- Describe the role and responsibility of the EMs.
- Meet the commitments identified in the CEMP.
- Confirm additional conditions from permits and approvals issued by RAs are included.
- Outline a communication plan between the EM, construction workers, RAs and the DFO-SCH/PSPC.
- Outline the marine- and land-based monitoring procedures, and adaptive management strategy for monitoring requirement outlined in the CEMP (e.g. turbidity, acoustics etc.), including consideration for changing ice conditions during construction ('shoulder season').
- Identify appropriate strategy for documentation and communication of wildlife observations.
- Outline environmental reporting plan, including how environmental concerns will be addressed proactively.
- Equipment required, its storage location and confirmation that enough equipment is on site for predictable events.
- Mitigation and monitoring measures required for implementation.
- Confirm that appropriate measures are in place for the management of SEC procedures in place for the collection, storage and disposal of any fluids considered contaminated and not appropriate for discharge in any water bodies.
- The types of waste expected from construction and the plan for their storage and disposal.
- Training and orientation programs to be taken by contractor personnel.

5.3.4 Spill Prevention and Response Plan

A Spill Prevention and Response Plan (SPRP) will identify spill prevention and response procedures for accidental spills and to confirm compliance with regulatory communication requirements. The SPRP will describe procedures for safe fuel handling and storage, including details of the requirements for secondary containment for equipment in addition to any specific procedures required for near- or over-water fuelling. The contractor must have spill response procedures in place. The purpose of the SPRP is to establish policies, procedures, and a communication matrix for the steps to be followed during an accidental spill.

The plan will encompass any environmental emergency or incident encountered during the Project and will layout the following:

- Location of fuel storage and re-fuelling areas.
- Identify fuelling procedures including additional requirements should near, on or over water fuelling be required.
- Identify and assess potential hazards.
- Identify and locate emergency resources and equipment.
- Educate construction and management personnel of their roles during an emergency.
- Establish emergency lines of communication and notification procedures.
- Develop, monitor, and adaptively manage systems for preventing accidents.
- Minimize adverse environmental effects resulting from accidents, malfunctions, and accidents.
- Provide a clear method of communication and administration.
- List possible areas where emergencies (fire, explosions, spills, etc.) might occur.
- Identify the possible outcome (injury, environmental damage, fatality).
- Determine required response and control measures (spill control, firefighting, etc.) including considerations for spills during the shoulder season when marine access may be limited/reduced.
- Determine resources and quantities that will be required to respond to the emergency.
- Determine training required to effectively respond to the emergency.
- Measures to be taken if wildlife do come in to contact with contaminants (e.g. spills) and when such procedures should be used.

Mitigation requirements are also stipulated in Section 5.4.24.

5.3.5 Quarry and Blasting Management Plan

A Quarry and Blasting Management Plan (QBMP) is intended to confirm the procedures for the safe operation of the quarry during construction and blasting. A QBMP will be developed to detail the operations and maintenance to be undertaken by the contractor during construction.

The QBMP will at a minimum describe the following:

- Site safety and security measures during construction and during the off season.
- Quarry design and equipment expectations.
- Steps for quarry development and operation.
- Summary of activities required to develop the quarry including vegetation removal (if required) and effects to watercourse (e.g. diversion, culverts if required).
- Quarry maintenance and monitoring plan.
- Dust, noise, SEC, acid rock drainage (ARD) and traffic management measures to be undertaken during quarry use.
- Explosives management procedure, including location of dangerous goods storage areas and use.

- Follow guidance provided in the Northern Land Use Guidelines – Pits and Quarries (GNWT 2015b)
- Identify measures required for abandonment or restoration subsequent to completion of construction to describe the appropriate decommissioning of the quarry following the guidance from the NIRB Abandonment and Restoration Plan (NIRB 2021). Measures will at a minimum consist of the following:
  - Slope stabilization (topography restoration).
  - Replacing soil.
  - Promoting re-vegetation.
  - Removal of waste.
  - Public safety measures.

5.3.6 Health and Safety and Emergency Response Plan

The Health and Safety and Emergency Response Plan (HSERP) is intended to establish Health and Safety procedures to be undertaken to confirm a safe working environment and Emergency Response. The contractor will develop a HSERP to address health and safety aspects of the Project as required by Nunavut Safety Acts and Regulations to address potential emergency situations that could occur at the Project site during the construction phases. The contractor will coordinate with the health centre supervisor and the fire chief in the development of the HSERP.

Possible emergency situations at the Project site during construction include:

- Fire/explosion.
- Vehicle and mobile equipment incidents.
- Marine vessel/equipment incidents.
- Hydrocarbon spill.
- Security breach.
- Wildlife encounters.
- Natural disasters and severe weather events.
- Major first aid/medical emergencies.

The HSERP must be prepared by the contractor and at a minimum will include:

- Emergency response flow chart and communication protocols.
- Emergency alarm signal.
- Designated safe assembly areas.
- Posted emergency phone numbers.
- Directions and contact information for the health clinic.
- A continuously available telephone.
- Site plan with locations of fire response equipment, first aid equipment, spill kits, muster stations etc.
- Specific emergency response procedures and responsibility for first response to a range of identified emergency scenarios.

- Evacuation and headcount procedure.
- Site first aid and medical services requirements.
- Training requirements for employees and response team members, including emergency drills.

5.3.7 Archaeological Resource Discovery Plan

An Archaeological Resource Discovery Plan (ARDP) is intended to confirm appropriate measures are in place should there be an archaeological discovery. An ARDP will be developed by the contractor that at a minimum describes the following:

- Measures to be taken if historical or palaeontological features (e.g. stone features, stone tools, modified bone, fossils) not previously recorded are identified within the construction footprint during construction.
- Measures to be taken if human remains are found within the Project footprints during construction.

5.4 Mitigation Measures

Mitigation measures to be implemented to minimize negative effects are provided in this section. The categories have been considered impacts developed during the NIRB permitting process, and while assigned to one category may be applicable to others. These measures, combined with the CWPs (see Section 5.3), and RA permits and approvals constitute the regulatory compliance program.

5.4.1 General

G1. A qualified EM will be present full time during key construction activities (terrestrial- and marine-based).

G2. The contractor will prepare a CCEMP which at a minimum meets the requirements of this CEMP.

G3. The contractor will suspend all Project activities should any dead or injured fish or wildlife (including birds, bird eggs, and their nests) be observed during any works or activities in and around the SCH, haul road, or quarry. Stop work procedures will be defined in the CCEMP.

G4. Stop work measures will be implemented should any non-compliance concerns arise. Corrective actions or adaptive management strategies will be discussed with the EM and implemented where necessary prior to re-starting work. Stop work procedures will be defined in the CCEMP, and at minimum meet the requirements discussed in Section 5.3.3.

G5. Lighting will be limited to the extent required to provide a safe work site and shielded and directed to reduce diffusion outside of the work area.

G6. Appropriate stop work and non-compliance reporting. See Sections 5.7 and 5.8.

5.4.2 Project Permit and Approval Compliance

PC1. DFO-SCH and their contractor will operate in compliance with applicable Acts, Regulations and Guidelines. This includes permits, approvals and authorizations received after issuance of this CEMP.

PC2. The contractor will maintain copies of Project permits, approvals and authorizations issued by RAs at the site at all times. The CCEMP will describe where and how (e.g. digital, paper) these permits are being maintained (see Section 5.3.3).

PC3. The contractor will provide to DFO-SCH copies of permit application(s) and contractor held permits.

PC4. A copy of each permit, license, or other authorization issued for the Project will be submitted to NPC and the NIRB as per S 137(4) of the NuPPAA. DFO-SCH will be responsible for the submission of permits on behalf of the contractor.

PC5. Adherence to appropriate BMPs (see Section 5.1).

PC6. The contractor will review the CCEMP and Project issued permits with Project personnel prior to such parties participating in any construction or other physical activities on the Project site.

5.4.3 Ground Stability and Permafrost

GSP1. The contractor will not move any equipment or vehicles unless the ground surface is capable of fully supporting the equipment or vehicles without rutting or gouging. Overland travel of equipment or vehicles must be suspended if rutting occurs. Measures to mitigate any potential rutting will be implemented if required.

GSP2. The contractor will confirm embankment thickness is suitable to limit disturbance to thermal regime.

GSP3. Haul road monitoring will be undertaken by the contractor to identify ground stability concerns. The contractor will undertake appropriate measures for stabilization, regular maintenance, of the haul road.

5.4.4 Surface Features

SF1. The Project will be conducted in a manner that minimizes surface disturbance outside of the Project site.

SF2. The contractor will return Project areas as directed by the Hamlet to their original condition upon completion of construction.

5.4.5 Hydrology

HD1. The contractor will minimize the number of water crossings, where possible, and when required they will be appropriately sized.

HD2. Work site boundaries will be flagged to prevent inadvertent loss or alteration of habitat.

HD3. Water flow will be maintained in lowland areas by installing culverts and/or other drainage techniques during road construction as deemed appropriate.

HD4. If water withdrawal is required to support the potential construction camp, the contractor will obtain the appropriate approvals from the NWB and DFO-FFHPP.

5.4.6 Air Quality

AQ1. Machinery and equipment will be maintained in good working order to minimize emissions.

AQ2. Dust suppressants and/or watering will be used to reduce dust generation from blasting to acceptable levels.

AQ3. The contractor will have an appropriate inspection and maintenance program in place for construction equipment and vehicles.

AQ4. Use of approved dust suppressants and/or watering to reduce dust generation for use of the haul road. Dust suppressants will be in accordance with the GN Department of Sustainable Development, Environmental Protection Service, and Environmental Guideline for Dust Suppression (Government of Nunavut 2002). The contractor will also be required to obtain the approval of the hamlet for which dust suppressants are acceptable.

AQ5. Proactive maintenance will be undertaken to address problem areas of the haul road which may produce significant dust.

AQ6. The contractor will be responsible for the selection of appropriate construction material for any road construction that will not require significant dust management efforts.

AQ7. Appropriate measures will be included in the TMP CWP (Section 5.3.2) to identify speed limits or other actions equipment operators need to consider to minimize dust, wildlife mortality, and other negative effects. The speed limit will be no higher than 20 km/hr (see Section 5.4.20.2).

5.4.7 Noise

Mitigations outlined within this section pertain to overland noise. For underwater sound mitigation measures, please see Section 5.4.12.

N1. All sound producing construction activities (e.g. blasting, pile driving, hauling) will be restricted to 12-hours/day during daytime.

N2. Any non-disruptive night works will require consultation with the community and approval by the Hamlet.

N3. All construction and road vehicles must be fitted with standard and well-maintained noise suppression devices and engine idling is to be minimized.

N4. Equipment will be located and oriented to minimize propagation of noise toward sensitive receptors.

N5. Implement control technologies such as the installation of silencers and mufflers on equipment where appropriate, limitations on engine revving where applicable.

N6. A notification protocol with input from the Hamlet and residents for advance notification of planned noise-causing activities, such as pile driving and blasting.

N7. During pile driving, the contractor will use methods that will minimize duration of driving activities.

5.4.8 Sediment and Water Quality

SWQ1. The EM will confirm that no construction activity results in exceedances of the Canadian Council of Ministers of the Environment (CCME) Approved Water Quality Guidelines (WQG) outside the work area. Compliance thresholds are stipulated in Section 5.5.4.

SWQ2. The EM will confirm appropriate SEC monitoring measures are in place to confirm that land-based activities do not result in sediment or other deleterious substances entering aquatic environments (freshwater, marine). Where appropriate equipment installations will be undertaken (e.g. turbidity curtain, silt fences) (see Section 5.4.9).

SWQ3. The contractor will not deposit any deleterious substances (e.g. fuel, chemicals, waste) into any aquatic environment (freshwater, marine) waterbodies. Should such activities occur, appropriate measures for response and reporting must be stipulated in the SPRP CWP (see Section 5.3.4). The minimum measures for SPRP are summarized in Section 5.4.24.

SWQ4. The contractor will not use any water nor construct or disturb any stream, lakebed or the banks of any definable water course unless otherwise authorized by the NWB and, if appropriate, by DFO-FFHPP.

5.4.9 Sediment and Erosion Control

SEC1. The contractor will describe an appropriate SEC Plan to minimize sedimentation of the aquatic environment (freshwater, marine) during construction. This plan will include compliance requirements expected from DFO-FFHPP, NWB or any other pertinent RA.

SEC2. Run-off will be visually monitored by the EM. If there is evidence of effects to the aquatic environment (freshwater, marine), appropriate perimeter controls will be applied to minimize or prevent sediment from entering the watercourse. Should sediment enter watercourses, turbidity monitoring will be undertaken as outlined in Section 5.5.4.

SEC3. Stockpiling and storage of material must occur in upland designated areas and be controlled in a way that debris and sediment entering the aquatic environment (freshwater, marine) will be minimized.

SEC4. Temporary sediment control measures will be applied at the base of any soil or rock stockpiles if required.

SEC5. Culverts and/or other drainage features will be installed at water crossings and in lowland areas to maintain flow and allow fish passage; any activities completed as part of this mitigation measure must be conducted in compliance with requirements from DFO-FFHPP and NWB.

5.4.10 Terrestrial Vegetation

V1. Project personnel will receive training to minimize negative effects on terrestrial vegetation (see Section 5.4.15 for details).

V2. Vehicle inspection requirements will be implemented to confirm equipment is clean and free of soil, invasive plants, and/or their seeds prior to arrival on site (see Section 5.4.21).

V3. Monitoring of disturbed areas for non-native and invasive species, as defined by the Government of Nunavut (2010) will occur on a regular basis. The frequency of monitoring will be described in the CCEMP (see Section 5.3.3).

V4. SEC measures will be implemented (see Section 5.4.9).

V5. Dust management measures will be implemented (see Section 5.4.6).

V6. If the construction camp is built in a previously undeveloped area, the contractor will be responsible for conducting an appropriate pre-construction vegetation survey in advance of installation of the construction camp (see Section 5.5.4 for minimum survey requirements).

5.4.11 Wildlife and Migratory Birds (Including Marine Birds)

WMB1. A pre-construction survey and sweep for wildlife (including migratory and marine birds) will be conducted by a qualified professional prior to initiating work in all Project areas. Minimum requirements are summarized in Section 5.5.3 and will be detailed in the CCEMP (see Section 5.3.3).

WMB2. In the event a sensitive species or wildlife habitat feature is identified, buffers (work exclusion zones) will be implemented to minimize disturbance to wildlife. Any protected feature that is harmed, destroyed, or disturbed will be reported, and may result in immediate notification to appropriate RAs (See Section 5.10.3).

WMB3. Monitoring of identified nests will be conducted by the EM to determine efficacy of implemented setbacks and buffers. Buffers may need to be increased based on 'alert' and 'flush' behavior to any varying work activities.

WMB4. Speed limits will be implemented to minimize negative effects to wildlife (see Section 5.4.20.2).

WMB5. Project personnel will receive training to minimize negative effects to wildlife (see Section 5.4.15).

WMB6. Work site boundaries will be flagged to prevent inadvertent loss or alteration of habitat outside of the designated Project footprint.

WMB7. No blasting will occur within established buffers from protected wildlife habitat features.

WMB8. If there are large flocks of marine or migratory birds near the Project during sound producing activities (such as pile driving), the EM will document their behaviour to confirm there are no adverse reactions. Work may need to be paused to allow birds to resume normal activity if birds continually flush or appear agitated by the activities.

WMB9. Polar bear sightings will be reported immediately so that appropriate actions can be taken to avoid conflict situations. In collaboration with the Hamlet and HTA, the CCEMP will identify who and where sightings are to be reported (see Section 5.3.3).

WMB10. Sightings of wildlife species, with particular attention to species at risk, will be recorded on a wildlife sighting form (including time, date, location, activity, and proximity to Project personnel). Wildlife sightings will be tracked in order to respond appropriately to emerging trends.

WMB11. A zero tolerance policy regarding the harassment, disturbance, and feeding wildlife whilst working on the Project.

WMB12. If the construction camp is built in a previously undeveloped area, the contractor will be responsible for conducting an appropriate wildlife survey in advance of construction (see Section 5.5.3).

5.4.12 Fish and Fish Habitat (Including Marine Mammals)

FFH1. The contractor will implement measures designed to minimize disturbance to seabed sediments and benthic communities and marine wildlife when carrying out project activities within the marine environment.

FFH2. All aquatic works will cease in the event of fish kill/injury or stress to aquatic wildlife is observed near the Site until the EM can provide guidance for the continuation of works.

FFH3. Construction equipment operators will maintain vigilance for marine mammals: minimum approach distances and best practices as outlined in the MMR must be adhered to, and protected areas as outlined within the most recent Notice to Mariners published by the Canadian Coast Guard (CCG) at the time of construction will be followed.

FFH4. Minimize disturbance to the seabed where eelgrass beds are located (with the exception of barge spudding and vessel anchoring).

FFH5. Soft-start procedures will be employed during any in-water impact pile driving to minimize impact to fish and marine mammals.

FFH6. An underwater acoustics program will be established for all construction activities that have the potential to result in acoustic disturbances for fish (and marine mammals). The minimum requirements for the program are summarized in Section 5.5.8 and the acoustic thresholds will be confirmed with DFO-FFHPP during the FAA application process.

FFH7. The hydrophone used for the acoustic program must be capable of recording in 'real time' to confirm appropriate compliance with fish and marine mammal thresholds.

FFH8. If construction is to occur during the iced-season, in-air sound levels will be measured as indicated in Section 5.5.9.

FFH9. For near water blasting, the contractor will define 'near water' in the CCEMP (Section 5.3.3), and acoustic monitoring as described in Section 5.5.8 will be undertaken. Justifications taken will be in alignment with guidance provided in Wright and Hopky (1998) or in the most recent guidance document for near water blasting.

FFH10. A marine mammal monitoring zone (MMMZ) and exclusion zone (EZ) will be established. The contractor will describe inclusion of the MMMZ and EZ in the CCEMP (Section 5.3.3) which will at a minimum meet the requirements described in Section 5.5.7.

FFH11. A marine mammal observer (MMO) will be present during all construction activities that require implementation of an EZ and have the potential to produce underwater sound and require acoustic confirmation.

FFH12. Should monitoring of the EZ occur in low light or dark conditions, the contractor will describe in the CCEMP what measures will be taken to confirm the MMO has the ability to monitor the EZ in low light conditions.

FFH13. Water will not be extracted from any fish-bearing waterbody unless undertaken in compliance with NWB and DFO-FFHPP legislative requirements (e.g. permitted through NWB, water intake is in compliance with DFO-FFHPP's standards and codes of practice [SCOPs] for end of pipe fish protection screens) (DFO 2019b).

FFH14. No blasting will occur in-water.

FFH15. If fish are encountered in creeks during haul road upgrades or quarry development, they will be rescued from the area and returned downstream. Adaptive management measures will be implemented for any further construction in or about that creek.

5.4.13 Species at Risk

SAR1. If species at risk are reported or observed, the EM will record, document, and monitor their presence (including time, date, location, activity, and proximity to Project personnel) and determine potential impacts to species at risk, as well as any modification to construction activities that may be required to protect species at risk.

SAR2. Caribou are not expected in the Project area. However, if caribou are sighted near a workspace, the EM will determine if work stoppage is required and when work can commence.

SAR3. Measures to protect caribou will follow those outlined in Appendix I of the North Baffin Regional Land Use Plan (NPC 2000).

5.4.14 Archaeological and Culturally Significant Sites

AR1. The contractor will develop an ARDP CWP (see Section 5.3.7) which will at a minimum meet the criteria identified in Section 5.3.7, and be implemented should historical or palaeontological features (e.g. stone features, stone tools, modified bone, fossils) be found during construction.

AR2. If potential human remains are found within the footprint during construction, the measures outlined in the ARDP will be implemented.

AR3. Project personnel will be prohibited from collecting any archaeological or palaeontological materials.

AR4. Project personnel will receive training on the implementation of ARDP requirements (see Section 5.4.15).

AR5. If the construction camp is built in a previously undeveloped area, the contractor will be responsible for confirming any archaeological survey requirements in advance of construction.

5.4.15 Training

TR1. The Project personnel induction program will include an Inuit cultural awareness component to promote understanding and respect for local culture and residents.

TR2. Project personnel will be educated on the wildlife (particularly SAR) expected to occur in the area according to scientific research and IQ/traditional knowledge through site induction and toolbox sessions.

TR3. Project personnel will be trained on the risks of damaging or disturbing vegetation and sensitive communities.

TR4. Project personnel will be briefed regarding the potential negative effects of construction activities to archaeological and palaeontological resources, and will be familiar with the ARDP CWP (Section 5.3.7).

TR5. Project personnel will be trained in the use of fire suppression aids. The contractor will describe measures in the HSERP CWP (Section 5.3.6).

TR6. Project personnel will be trained and qualified to safely handle the hazardous waste and materials. The contractor will describe measures in the CCEMP (Section 5.3.3).

TR7. The contractor will properly train Project personnel in fuel and hazardous waste handling procedures, as well as spill response procedures. The contractor will describe measures in the SPRP CWP (Section 5.3.4).

TR8. Project personnel will be trained in the spill prevention and response requirements during site induction and subsequent toolbox talk sessions. The contractor will describe measures in the SPRP CWP (Section 5.3.4).

5.4.16 Communication

Mitigations outlined in this section pertain to communication with RAs, stakeholders, the Hamlet, Hunters and Trappers Association (HTA), and community members.

CO1. Appropriate communication and documentation measures will be in place for reportable incidents (Section 5.10.2), non-compliances (Section 5.8) and adaptive management measures implemented (Section 5.6). The communication protocol will be described in the CCEMP (see Section 5.3.3).

CO2. A notification protocol will be implemented with input from the Hamlet, HTA, community members and other stakeholders for advance notification of planned noise-causing activities (e.g. blasting, pile driving).

CO3. Construction notices will be posted as outlined in Section 5.11.2. The contractor will detail locations and timeline of where and when the construction notices will be posted within the CCEMP (see Section 5.3.3).

CO4. Communication requirements as required by permit conditions to specific RAs will be completed as required. Parties responsible for RA communications is addressed in Section 5.11.1.

CO5. The contractor will engage with the HTA, Hamlet and the community prior to every construction season to discuss planned construction activities, Project schedule, and to obtain feedback from the community to confirm that construction activities do not impede or interfere with any community activities and harvesting.

CO6. The contractor will coordinate with the health centre supervisor and the fire chief in the development of the HSERP.

CO7. The Project will consult and coordinate with cruise ship operators and outfitters to confirm that their access is not impeded, and the safety of passengers is maintained.

CO8. The contractor will include the DFO-SCH representative on communications with RAs, stakeholders or other community groups related to Project activities.

CO9. Communication protocols will be established to notify the community of marine activities, including ongoing consultation with the community and HTA.

CO10. An appropriate communication plan will be detailed in the CCEMP (see Section 5.3.3) to confirm that the EM and MMO have clear communication protocols with the contractor's site supervisor/foreman should shut down or other activities be required to be quickly communicated during construction.

CO11. Daily blasting notices will be posted on radio, social media, hamlet, and on Very High Frequency (VHF) radios for cabin owners at Victor Bay. Blasting will generally occur at the same time every day so that residents can plan accordingly.

5.4.17 Land and Resource Use

LRU1. The contractor will conduct project activities in a manner that will not interfere with Inuit harvesting or traditional land use activities.

LRU2. Appropriate access for boaters to launch their boats and access the marine environment will be maintained at all times throughout construction.

LRU3. Project personnel will not hunt or fish, unless proper Nunavut authorizations have been acquired.

LRU4. The contractor will construct skidoo access over any potential barriers caused by the work, including stockpiles or stockpile pads to allow hunters to pass through.

LRU5. Road closures for blasting will be limited to approximately 30 mins/day once a day.

LRU6. Daily road closure notices will be posted on radio, social media, hamlet, and on VHF radios for cabin owners at Victor Bay.

LRU7. Road closures will aim to be at the same time every day so residents can plan accordingly.

LRU8. Communication requirements pertinent to land and resource use as described in Section 5.4.16.

LRU9. The contractor will rip and stockpile carving stone at the quarry for community use to confirm that access to carving stone is not impacted by the Project.

5.4.18 Human Health and Community Wellness, Infrastructure, and Services

HCW1. The contractor will prepare a Code of Conduct. As part of their employment with the contractor, Project personnel will be required to sign the Code of Conduct governing their behaviour on the job and during recreational hours to reduce the likelihood of negative social effects on the community. This will include adherence to all rules at construction sites and at the construction camp.

HCW2. There will be a zero-tolerance policy for possession or use of marijuana, illicit drugs, or alcohol.

HCW3. First aid response will be conducted in accordance with WSCC requirements and emergency medi-vac procedures will be in place for the construction workforce.

HCW4. Communication requirements pertinent to human health and community wellness, infrastructure, and services as described in Section 5.4.16.

HCW5. The contractor will describe fire response procedures in the HSERP CWP (see Section 5.3.6) as well as provide training to Project personnel on the use of fire suppression aids to minimize impacts to the local fire service.

HCW6. The CCEMP will describe appropriate measures to be taken to confirm there is no strain put on the community's fuel supply (see Section 5.3.4).

HCW7. The contractor will have a dedicated fuel truck for meeting Project fuel requirements and have available temporary double-wall fuel tanks for fuel storage during construction, if necessary, to confirm that the community's fuel supply is not impacted by the Project.

HCW8. The contractor will provide dedicated trucks to support construction needs should there be a strain on the community from using the Hamlet's trucking services for water or sewage.

HCW9. Traffic management procedures will be in place as described in Section 5.4.17.

HCW10. Safety measures as stipulated in the HSERP CWP (Section 5.3.6) to be followed.

HCW11. The contractor will identify houses/buildings that are at risk of falling rock. Control fencing will be installed (e.g. 1.8 m tall orange fencing using rebar) uphill of these buildings and will be detailed within the QBMP CWP (see Section 5.3.5).

HCW12. The contractor will work with the Hamlet on determining a suitable location for the construction camp. The location of the construction camp must be approved by the Hamlet.

5.4.19 Employment, Training and Business Opportunities

ETB1. The contractor will comply with the new Treasury Board Directive on Government Contracts Including Real Property Leases, in the Nunavut Settlement Area (Government of Canada 2019a) and will aim to maximize participation of Inuit labour, training and Inuit owned businesses on the Project.

ETB2. Communication requirements pertinent to employment, training and business opportunities as described in Section 5.4.16.

5.4.20 Traffic Management

Measures to meet compliance requirements in this section will be detailed in the MSP and TMP CWPs (see Sections 5.3.1 and 5.3.2).

5.4.20.1 Marine Transportation

TM1. Communication with marine users (e.g. sealift, commercial fishing fleets, tourism operators, local boaters) to confirm access is not disrupted. This communication plan will be detailed in the MSP CWP (Section 5.3.1).

TM2. Prior to the commencement of any vessel-related activities, the contractor must contact the CCG Marine Communications and Traffic Services (MCTS) Program, (email: NAVWARN.MCTSPrescott@innav.gc.ca, Telephone: 613-925-0666, Facsimile: 613-925-4519) regarding the issuance of a NAVWARN to advise the marine community of potential hazards associated with the Project. The NAVWARNs must be terminated when appropriate at the end of each construction season.

TM3. During vessel-related activities, the contractor will:

a. Position vessels and equipment associated with the Project in such a manner so as not to obstruct line of sight to navigational aids or markers.
b. Exhibit the appropriate lights and day shapes at all times (compliance with the Collision Regulations).
c. Monitor the VHF channel used for MCTS communications in the respective area at all times and participate as necessary.
d. Be familiar with vessel movements in areas affected by the Project.
e. Plan and execute the Project in a manner that will not impede navigation or interfere with vessel operations.
f. During night hours, moor the rig and associated equipment outside the navigation channel with lighting accordance with all applicable regulations.

TM4. The marine working area will be clearly defined with safety and navigational buoys.

TM5. Construction vessels will keep to pre-defined work areas and routes that will not interfere with sealift deliveries and to minimize the impact on existing traffic and navigation.

TM6. Clear communication protocols or procedures for vessels working in the area will be established.

TM7. A permit or approval will be issued by TC under the CNWA, which will include notification and communication protocols for marine users to be aware of potential navigation interferences. contractor will be updated with any additional requirements.

TM8. Vessels will be appropriately marked in accordance with the Collision Regulations administered by TC.

TM9. Compliance with the MMR for appropriate distances to marine mammals during vessel transit.

TM10. Movement of vehicles and machinery will be restricted if any large congregations of wildlife or birds occur in the SCH. The EM will determine if work stoppage is required and when work can commence.

5.4.20.2 Land Based Transportation

TM11. Drivers will be properly trained and licensed. Personnel will be encouraged to drive defensively and courteously.

TM12. A Project specific speed limit will be enforced for the haul road route, unless otherwise specified by the Hamlet. Speed limits will be set such that community safety is maintained, for the control of dust mobilization, and minimization of harm to wildlife. The details of this will be summarized in the TMP CWP (see Section 5.3.2).

TM13. All vehicles will have adequate lighting so they can be easily seen.

TM14. Combustion emissions sources (machinery) and staging areas for vehicles and heavy-duty machinery will be located away from sensitive receptors.

TM15. Consultation and coordination with existing road service providers in the Hamlet. Road use will not disrupt the delivery of community services (including emergency services) and will be done in consultation with the Hamlet administration.

TM16. Construction equipment will be sized correctly for the task and in compliance with Hamlet road restrictions.

TM17. Traffic control measures will be implemented at intersections along the haul road route, as required. This may include the use of a traffic monitor.

TM18. Road improvements will allow for pullouts for resident vehicles and rock trucks to pass one another and to ease tight turns. This will be determined by the contractor.

TM19. Given the volume of truck traffic expected and the fact that roads are shared by many users including all-terrain vehicles (ATVs), snow machines, trucks, cyclists, and pedestrians, appropriate safety measures for shared use will be defined in the TMP CWP (see Section 5.3.2) avoid traffic accidents.

TM20. Ongoing visual assessments of the potential for dust generation and combustion emissions will be conducted (during work and/or when machinery is operating) to determine requirement for the implementation of dust suppression measures.

TM21. Suitable dust suppressants (non-toxic and biodegradable) to reduce dust generation to acceptable levels will be used.

TM22. The contractor will minimize the impact to useable parking and storage at the SCH and adjust his work plan to support the community's needs in the area.

TM23. The contractor will consult and coordinate with the sealift companies and the Hamlet to avoid conflicts with sealift operations.

TM24. A traffic awareness campaign concerning road safety, particularly for children and teens will be implemented in the community. The contractor will describe this strategy in their TMP CWP (Section 5.3.2).

5.4.20.3 Air Based

TM25. To reduce impacts on air transportation, the Project will plan accordingly so that it does not monopolize commercial flights. The Project will use private charter flights to transport work crews as necessary, so the Project does not take up seats on scheduled flights that the community depends upon.

TM26. Due to the Project site being in close proximity of the Arctic Bay airport, the contractor will be responsible to confirm if Notice to Airmen (NOTAM) will be required through Nav Canada (NavCan). If a required, a notice must be filed with NavCan a minimum of 10 days prior to the start of each construction season to confirm the time of and seasonal duration of blasting and other activities that could affect air traffic. Initial communication with NavCan must be a minimum of 30 days prior to construction to confirm what measures are required.

5.4.21 Equipment Operation and Maintenance

EOM1. Vehicle washing areas for haul trucks, if required, will only be permitted in specific areas and will include an water separator sized appropriately for expected flows and conditions. Permitted vehicle washing areas will be detailed within the TMP CWP (see Section 5.3.2).

EOM2. All equipment will be maintained and in good working order to prevent leaking or spilling of deleterious substances into the environment (e.g. hydraulic fluid, lubricants, diesel, gasoline).

EOM3. The contractor will confirm that the appropriate equipment is selected for site conditions (i.e. trucks have appropriate power and braking capabilities to handle the steepness of the haul road) and appropriately maintained (e.g. regularly scheduled brake and light checks). If deemed necessary, the contractor will provide a runway lane.

EOM4. In addition to EOM2 and EOM3, the contractor will develop a site inspection protocol and maintenance program to confirm their equipment is maintained in an appropriate condition for Project use and site conditions.

EOM5. Vehicles and equipment mobilized to site will be inspected before departing place of origin to confirm they are clean and free of soil, invasive plants, and seeds prior to arrival on site.

EOM6. Revving of engines on mobile or stationary machines will be limited and equipment not in use will be shut down (restrict idling).

EOM7. Gas or diesel engine exhausts will be fitted with noise mufflers, where available.

EOM8. All lubricants and hydraulic fluids used on equipment that will be working below the high water line (HWL) will be biodegradable and non-toxic, as appropriate.

EOM9. Heavy equipment will only use the intertidal access during low-tide (dry) conditions, and only under circumstances that have been agreed to with DFO-FFHPP.

EOM10. At no time will equipment operate 'in-water'. The contractor will confirm appropriate equipment reach for land-based construction or work schedule works around appropriate tides.

5.4.22 Hazardous Material Handling, Storage, and Disposal

All measures related to storage and appropriate handling of fuel are in Section 5.3.4.

HM1. Project personnel will receive appropriate training for the storage and handling of dangerous goods and hazardous material (Section 5.4.15).

HM2. The contractor must outline appropriate measures for storage and disposal of any materials considered as hazardous materials within the CCEMP (see Section 5.3.3); measures outlined within this section must also be incorporated.

HM3. Inspections of the hazardous waste and materials management will be performed and recorded at least weekly.

HM4. The contractor, on behalf of DFO-SCH, will confirm there is no storage of hazardous material within thirty-one (31) metres of the HWL of any aquatic environment (freshwater, marine) or within the same proximity to other sensitive habitats in such a manner to prevent their release into the environment unless otherwise authorized by the pertinent RA (e.g. NWB, or DFO-FFHPP).

HM5. Based on the properties of the waste or materials to be stored, a suitable container will be selected: hazardous materials will be stored in their original containers, where possible, or in containers specially manufactured for the purpose of storing a specific hazardous waste or materials.

HM6. Containers used for hazardous waste and materials will not be used for non-hazardous waste types.

HM7. All hazardous waste and materials will be stored on a firm working surface that is impervious to leaks and stored within a container of at least 110% capacity of the total volume of substances to be stored and will be inaccessible to wildlife.

HM8. Drainage into and from the storage area will be controlled, and/or suitable secondary containment implemented, to prevent spills or leaks from leaving the site and to prevent run-off from entering the site.

HM9. Containers will be sound, sealable and not damaged or leaking and closed at all times, except when in use.

HM10. Incompatible waste and materials will be stored in a manner that, in the event of a spill or accidental release, contact is not possible (i.e. corrosive materials must be kept away from flammable materials).

HM11. Containers will be placed in a manner that can readily and easily be inspected for signs of leakage, corrosion, or deterioration. Leaking, corroded, or deteriorated containers will immediately be removed, and their contents transferred to a sound container.

HM12. Hydrocarbon contaminated soils will be removed and treated on site or transported to an approved disposal site for treatment.

HM13. Shipping and transportation of dangerous goods (DGs) will be registered with Government of Nunavut and appropriate shipping documents will accompany movements of DGs in accordance with the federal *Transportation of Dangerous Goods Act* and *Regulations*. The contractor will outline appropriate measures to satisfy this requirement within the SPRP CWP (see Section 5.3.4).

HM14. Records are to be maintained indicating the type and quantity of waste being stored along with the date, type and quantity of hazardous waste brought into or removed from the facility. These records are to be provided in DFO-SCH in the pertinent weekly report (see Section 5.10.1) and made available upon request.

HM15. Any open source of ignition, open flame, hot works, or smoking is prohibited in the hazardous waste and materials storage area. Designated smoking areas will have appropriate fireproof containers for waste.

HM16. Storage and handling procedures designed to prevent harm to personnel and the environment from hazardous materials, as per the Safety Data Sheets (SDS), will be implemented. SDS will be kept on-site.

5.4.23 Waste Management (Including Waste Water)

WM1. Daily site cleaning (housekeeping practices) and routine inspections will be completed to confirm materials are correctly sorted and placed in the proper bins. Inspections are to be documented and documentation made available to DFO-SCH if requested.

WM2. All waste that cannot be disposed of at the local landfill will be removed from site for disposal at an approved Facility. The acceptance criteria of the Approved Facility will be confirmed by the contractor. If waste needs to be accumulated and stored until the end of construction, the storage location will be confirmed by the contractor, with appropriate storage measures in the CCEMP (see Section 5.3.3).

WM3. Any debris that enters the marine environment will be retrieved and disposed an approved facility.

WM4. All garbage, fuel, and equipment will be removed upon abandonment and completion of the construction activities.

WM5. All Project activities will be conducted in a manner that prevents waste material including deleterious substances from entering any aquatic environment (freshwater, marine).

WM6. All food, food waste, and other attractants will be handled, stored, and disposed of safely to avoid attracting and habituating animals.

WM7. Waste will be segregated in clearly marked waste containers applicable to the end use (e.g. landfill waste categories used by the Hamlet; i.e. wood waste).

WM8. Domestic waste containers will be kept closed (e.g. equipped with lids, covers / tarps over skips) at all times except when bins are being emptied or filled, to prevent scavenging by wildlife and domestic animals, as well as to control odour.

WM9. Waste will not be deposited in, or placed on land, ice or where the waste may enter Arctic waters.

5.4.24 Spill Prevention and Response Plan

A SPRP CWP will be developed by the contractor, with minimum requirements described in Section 5.3.4.

SRP1. All spills will be reported in accordance with the *Spill Contingency Planning and Reporting Regulations* by calling the 24-hour Spill Report Line at 867-920-8130.

SRP2. Relevant prevention and response measures as detailed in Sections 5.4.21, 5.4.22, 5.4.23, 5.4.24 for equipment maintenance and operation, storage of waste (including DGs), and fuelling practices.

SRP3. Appropriate training measures as outlined in Section 5.4.15.

SRP4. Spill kits will be readily available, appropriately stocked, and will be appropriate to the type and amount of hazardous and waste materials anticipated for the Project. Standard spill kits typically contain absorbent booms, socks, pads, waste bags and ties, and personal protective equipment (PPE) such as gloves and goggles. Further details on the contents of the spill kits will be provided by the successful contractor.

SRP5. All fuel-carrying equipment will be accompanied with spill prevention, containment, and clean-up materials that are suitable for the volume of fuels carried.

SRP6. The contractor will develop designated fueling locations to minimize the number of areas of risk. Procedures outlining management of land and marine based equipment fueling will be detailed within the SPRP CWP (see Section 5.3.4) and abide by BMPs.

SRP7. A boom will be available on site in the event of a spill, and all equipment should have a spill kit readily available. The contractor personnel are to be trained in the deployment of this emergency spill equipment.

SRP8. The contractor's SPRP CWP (see Section 5.3.4) will consider additional measures required during shoulder seasons, should launching boats be challenging (e.g. deployment of boom). Shoulder seasons are considered times of year when ice conditions do not allow the safe deployment of a vessel.

5.5 Monitoring by the Environmental Monitor

Monitoring measures, completed by the EM to meet compliance requirements, are described in this section, with details to be summarized in the CCEMP (see Section 5.3.3). The EM will be responsible for appropriate documentation of construction activities and for environmental monitoring to confirm measures are tracked for reporting, and that information and details are available for conducting necessary communications with RAs, stakeholders, the Hamlet, and the HTA.

5.5.1 General

Primary responsibilities of the EM will be to:

- Conduct regular monitoring with additional presence based on sensitivity of construction activities or when extreme adverse conditions are anticipated on site.
- Undertake monitoring during below HWL construction and any other higher risk activities, such as equipment encroachment near aquatic environments (freshwater, marine), or those associated with emergency events.
- Visual monitoring of construction as outlined in Section 5.5.2.
- Monitor and adaptively manage work procedures as necessary to limit environmental effects.
- Monitor wildlife features (e.g. nests), buffers, and setbacks as outlined in Section 5.4.11.
- Monitor chance find species at risk, as outlined in Section 5.4.13.
- Monitor for large congregations of seabirds and communicate with Project personnel to avoid those areas while the birds are present.
- Routinely check to verify that equipment in use at Project site is in good working condition.
- Routinely check to determine that the required emergency response materials, including the spill kits, are on site and appropriately stocked during Project construction.
- Confirm site personnel are aware of and trained in emergency procedures outlined in the SPRP.
- Confirm that mitigations outlined within Section 5.4 are strictly adhered to.
- Report any non-compliance or unplanned events as outlined in Section 5.8.
- Reporting requirements as described in Section 5.10.

5.5.2 Visual Monitoring

Visual monitoring during the Project will be ongoing and will include:

- Monitoring of stressors on aquatic species, fish kills, any fish spawning/migration activity.
- Sightings and behavioural observations of terrestrial wildlife, including any injured wildlife observed.
- Monitoring of any sensitive habitat features and buffers identified during the pre-construction terrestrial wildlife sweep (see Section 5.5.3).
- Incidental SAR occurrences.

Details of sightings including species, number, and behaviour of wildlife observed will be included in the pertinent weekly reports (see Section 5.10.1).

5.5.3 Pre-Construction Terrestrial Wildlife Sweep

A pre-construction terrestrial wildlife (including migratory and marine birds) sweep will be conducted by the EM or a qualified wildlife biologist, within seven days of initiating work in a Project area. Works must not begin until this sweep has been completed and confirmed that additional mitigation measures are not required. The sweep should include the Project area plus a 100 m buffer. The purpose is to identify sensitive wildlife and their habitat features, such as active bird nests, wildlife dens, and wildlife foraging or traveling routes. Where work has not started within seven days following the wildlife sweep, the area should be re-swept for new wildlife features (e.g. nests) that may have established in the interim.

In the event a sensitive species or habitat feature is identified, buffers (work exclusion zones) will be implemented to minimize disturbance to wildlife until the feature becomes no longer active (e.g. until the young have permanently left the nest). Buffers will be based upon 'alert' and 'flush' behaviour distances of individuals as determined by the EM and/or standard government-recommended setback distances.

5.5.4 Pre-Construction Vegetation Survey

In the event of footprint relocation or expansion into previously undisturbed and unmapped areas (such as areas outside the previously mapped Project Study Area), an ecological land classification (ELC) survey, terrestrial vegetation inventory, and rare plant assessment will be conducted by a qualified vegetation specialist to identify vegetation communities and plants occurring within the new area.

Vegetation communities will be grouped based on similar characteristics such as species composition, topographical position, moisture regime, and percent cover of bedrock. Vegetation communities will be identified using a combination of field verification and interpretation of desktop aerial imagery. The vegetation inventory will be conducted using a random meander technique, and vascular and non-vascular species encountered will be inventoried. The rare plant assessment will target areas where desktop pre-mapping identifies potentially unique habitats or vegetation communities.

5.5.5 Turbidity

During construction activity near the aquatic environment and in the event there are concerns/considerations for effects to water quality based on visual monitoring, turbidity monitoring will be conducted based on federal CCME WQG (CCME 1999) for turbidity. The CCME criteria for turbidity is defined as:

1. For clear flow water: maximum increase of 8 nephelometric turbidity units (NTUs) from background levels for a short-term exposure (e.g., 24-hour period). Maximum average increase of 2 NTUs from background levels for a longer-term exposure (e.g., 30-day period).
1. For high flow or turbid waters: maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Should not increase more than 10% of background levels when background is > 80 NTUs.

A turbidity compliance monitoring zone (CMZ) will be defined by the contractor and outlined in the CCEMP (see Section 5.3.3) based on construction activity type for when compliance monitoring is to be conducted. The CMZ will be based on logical reasoning for where turbidity effects due to the Project should have reasonably dissipated and may need to be approved by pertinent RAs (e.g. DFO-FFHPP).

The contractor will detail within the CCEMP the procedure for turbidity compliance monitoring within the CMZ. Compliance sampling will be conducted at a minimum of three locations around the perimeter of the defined CMZ in addition to background measurements (e.g. measurements taken in advance of construction, at nearby unimpacted locations).

5.5.6 Sediment and Erosion Control

The contractor will be responsible for implementing SEC measures (e.g. sediment traps, silt fences). The EM will verify appropriate controls have been put in place prior to the start of construction and the contractor will be responsible for inspecting and maintaining the controls daily to confirm they are functioning as intended. Water quality at the Project site will be monitored for sediment run-off; if visual monitoring identifies sediment run-off, turbidity will be monitored as detailed in Section 5.5.4.

5.5.7 Marine Mammal Observation

The MMO will monitor for the presence of marine mammals during pile driving and for other activities if stipulated by DFO-FFHPP in the FAA. An EZ will be established through the acoustic monitoring program (see Section 5.5.8), and the MMMZ will be 100 m to 200 m more than the EZ (to be defined in the CCEMP [see Section 5.3.3]).

The MMO will maintain continuous observations (e.g. species, number, behaviours) to document any avoidance or disturbance behaviour and implement appropriate mitigation measures as required. Details of marine mammal observations will be recorded including, but not limited to, species, group size, and behaviours. The contractor will provide a demonstrative MMO documentation form in the CCEMP (see Section 5.3.3).

A pre-activity observation period will occur for 30-minutes prior to the start of pile driving, or when the activity has been terminated for more than 30-minutes on any given day. Pile driving will be suspended (see Section 5.7 for stop work measures) if a marine mammal enters the EZ and will not restart until the marine mammal is observed leaving the EZ or until the marine mammal is not spotted for a 30-minute period. A 30-minute post-activity observation period of the EZ and MMMZ will be conducted.

Included within the CCEMP (see Section 5.3.3) will be a communication plan to enable the MMO to efficiently communicate the presence of marine mammals that enter the EZ or MMMZ, and protocols for issuing stop work orders due to acoustic exceedances for marine mammals and fish.

5.5.7.1 Exclusion Zone

Initially, the EZ will be established within a 500 m radius of the pile driving at the fixed wharf. The EZ will be expanded or retracted based on the results of the acoustic monitoring program (see Section 5.5.8). There will be a minimum EZ based on activity type, which will be described in the CCEMP (see Section 5.3.3) and will be in compliance with any requirements from pertinent RAs (e.g. DFO-FFHPP). DFO-FFHPP will confirm if EZs are required for any other construction activities at the SCH.

Once the EZ has been established, the MMO will monitor both the MMMZ and the EZ. The MMMZ will be visually monitored for the presence/absence of marine mammal species, numbers and behaviours.

5.5.8 Underwater Sound

An acoustic monitoring program will be undertaken for pile driving at the SCH and for near-water blasting at the quarry. Underwater sound threshold values provided in this CEMP are based on current guidance from DFO-FFHPP. Any threshold values outlined within the FAA will take precedence. Whether a continuous or confirmatory compliance program is undertaken will be confirmed by DFO-FFHPP and through community consultation. Should pile driving at the SCH or blasting at the quarry occur during the iced-season, DFO-FFHPP will confirm if underwater sound monitoring is required under ice.

The intention of acoustic measurements for marine mammals is to establish the perimeter of the EZ based on a sound threshold, and for fish is to confirm that recommended thresholds are not exceeded at 10 m from the sound source. The fish and marine mammal thresholds must be confirmed during pile driving at the SCH, where only the fish threshold requirement will be relevant to near-water blasting at the quarry.

The hydrophone used to perform underwater sound monitoring must be capable of recording 'real time' acoustics for sound exposure level (SEL), accumulated sound exposure level (cSEL), and Peak root-mean-square (RMS) measurements in order to confirm immediately compliance with acoustic thresholds. Sound will initially be measured at 10 m from the sound source and if there are no exceedances to the marine mammal thresholds then further out measurements are not required. If they do exceed the marine mammal thresholds, then measurements will be taken at 200 m, and then 500 m or until the size of the EZ can be established. If the EZ is larger than 500 m, then a discussion must ensue for if the EZ can be competently observed by one individual or if another MMO is required.

5.5.8.1 Marine Mammals

- The MMO will monitor the Project related sound and compare to ambient sound levels (when no sound producing activity is underway) and the marine mammal acoustic threshold (160 dB re 1µPa rms).
- A calibrated hydrophone will initially be positioned to measure underwater sound levels at 10 m from the sound source. Ambient sound levels will be measured from the same location prior to the start of the construction activity. If the underwater sound levels at 10 m are below the threshold (160 dB re 1µPa rms), the 200 m measurement will not be required. However, if sound is exceeded at 200 m, then acoustic monitoring will be performed at the 500 m distance.

5.5.8.2 Fish

- The MMO will monitor Project related sound and compare to ambient sound levels to underwater sound fish thresholds at 10 m from the sound source.
- Underwater sound levels should not exceed, within 10 m from the sound source:
  - Peak sound pressure level (SPL): 206 dB re1 µPa
  - cSEL: 186 dB re μPa^2s

- If underwater sound levels are observed to exceed the thresholds, then work must be halted (see stop work measures in Section 5.7). After consultation with DFO-FFHPP, work can resume only after additional measures have been implemented (e.g., bubble curtains).

5.5.9 Iced-Season Sound Monitoring in Air

If the contractor undertakes construction during the iced-season at the SCH, monitoring measures as below will apply:

- In-air monitoring will be measured, and presence of pinnipeds monitored on the ice:
  - In-air acoustic threshold for non-harbour seal pinnipeds of 100 dB re 20µPa rms is adopted.
  - Project activity will be suspended if seals are exposed to sound levels above the threshold.

5.6 Adaptive Management

During the Project, it may be necessary to modify methodology and address site conditions not foreseen in this CEMP. A communication plan will be described in the CCEMP (see Section 5.3.3) to confirm how engagement between the EM, the contractor, and DFO-SCH are carried out to accept any changes. The EM will then evaluate any additional potential environmental effects or regulatory requirements. Mitigation measures will be updated, if required, and documented within the CCEMP. Adaptive management reporting will be detailed within the construction monitoring reports in accordance with Section 5.10.1.

5.7 Stop Work

Stop work procedures will be implemented when necessary based on specific conditions. A clear communication strategy must be described in the CCEMP (see Section 5.3.3) to outline how EMs/MMOs can notify the construction site supervisor/foreman when this is necessary.

5.8 Non-Compliance

In the event of a Project non-compliance or a potential non-compliance with the CEMP, CCEMP, and/or applicable environmental permits, the EM/MMO has the authority to suspend construction activities and/or implement adaptive mitigation strategies (see Section 5.6) to re-instate Project compliance.

The contractor will maintain and retain records associated with, or produced by, actions or activities undertaken to achieve compliance or that indicate non-compliance with Project permit conditions. These records must be made available at the request and must be documented in the pertinent weekly report. Non-compliances must be reported to DFO-SCH immediately (before end of construction shift). Non-compliance reporting protocol to pertinent RAs will be determined by DFO-SCH and communicated to the contractor prior to the start of construction.

5.9 Complaints Mechanism

An effective and well-functioning complaints mechanism is an essential part of managing community relations. For residents, project effects such as noise, dust, vibration, traffic, influx of Project personnel, and restricted access can cause disturbances or stress, and may result in public concerns about health and safety.

The contractor will implement a procedure for managing complaints from residents and stakeholders and will also document complaints received in corresponding weekly construction monitoring reports (see Section 5.10.1).

The objectives of the procedure are to:

- Provide affected people with straightforward and accessible ways for making a complaint.
- Confirm that appropriate and mutually acceptable corrective actions are identified and implemented, if deemed appropriate.
- Verify that complainants are satisfied with outcomes of corrective actions.

The procedure will be pro-active and responsive, and will involve the following components:

- The contractor will identify who on their team is responsible for complaints communication.
- The contractor will identify who is responsible for communications in the CCEMP.
- The contractor will receive, log, and track complaints within a specified time frame.
- The contractor will confirm that there is a response to complaints within a specified acceptable time frame. The name of the contractor will be provided to Project personnel and residents and stakeholders.
- The publishing of a 24-hour toll-free telephone number, Project website, and email.
- A register of complaints and the actions taken to mitigate complaints.
- The investigation of complaints, including researching any previous issues and verifying if any requirement has been breached, or whether excessive traffic, noise, vibration, dust etc. has occurred unnecessarily.
- The planning and implementation of corrective actions, if appropriate, involving the possible modification of construction techniques and/or equipment to avoid any recurrence or minimize negative impact.
- The keeping of complaint details including: records regarding the source and time; nature of the complaint; the activities being conducted and the weather conditions at the time of detection; and, the complainant's name, address and contact number.
- Follow-up monitoring or other investigations if necessary, to confirm the effectiveness of the corrective action.
- Informing the complainant of the successful implementation of the corrective action that has been taken to mitigate the adverse effects.
- Inclusion of summary reports on complaints in the weekly construction monitoring reports for the Project.

5.10 Reporting

Reporting requirements including incident reporting and RA reporting during the Project is outlined within this section.

5.10.1 Construction Monitoring Reports

A weekly summary monitoring report will be prepared by the EM during construction. The monitoring reports will be submitted as directed by DFO-SCH. The contractor will provide a reporting schedule, which must also be approved by DFO-SCH. See Section 5.10.1.1 for minimum contents of weekly reports. The EM will be responsible for taking appropriate daily notes and for tracking the MMO notes for relevant activities.

5.10.1.1 Minimum Reporting Contents

Weekly reports will, at a minimum, contain:

- Construction activities being conducted.
- Photographs of construction and status (e.g., percent complete).
- Name(s) of EM/MMO on-site.
- Date.
- Weather conditions.
- Equipment used and its condition.
- Environmental meeting notes (including tailgate) and key issues discussed.
- Design updates and construction activities for that period.
- Mitigation measures implemented during that period as well as any future proposed activities.
- A record of community concerns/complaints received.
- Compliance and sighting report of terrestrial and marine organisms observed by the EM and Project personnel during construction. Project personnel will report sightings to the EM. This will include a detail of species, number, behaviours of the wildlife observed.
- Water sampling data (if conducted).
- Acoustic monitoring (if conducted).
- Summary of any adaptive management actions required.
- Outstanding environmental issues and/or non-compliances, including corrective actions.
- Planned activities for the following two weeks.

5.10.2 Reportable Incidents

The contractor will be responsible for the reporting of incidents to DFO-SCH. DFO-SCH will confirm incident reporting protocol to the contractor prior to construction to confirm that pertinent RAs are appropriately informed.

Adaptive management measures, stop work orders issued, and Project non-compliances must be reported as summarized in Sections 5.6, 5.7, and 5.8 respectively.

5.10.2.1 Canadian Environmental Protection Act

In the event of an emergency that is reportable under the *Canadian Environmental Protection Act*, 1999 (CEPA). A reportable incident is defined as an incident resulting in:

- A potential/actual contravention of legislation. According to Section 64 of CEPA, substances are considered harmful if they are entering or could enter the environment in quantities or concentrations or under conditions that:
  - Have or may have an immediate or long-term harmful effect on the environment or its biological diversity.
  - Constitute or may constitute a danger to the environment on which life depends.
  - Constitute or may constitute a danger to human life or health in Canada.
- A potential/actual contravention of a permit/approval condition.
- A significant non-compliance with this CEMP resulting in environmental effect.
- Adaptive management measures implemented, and results of additional monitoring triggered by the exceedance can be submitted to DFO-FFHPP, if requested.

5.10.2.2 Government of Nunavut Department of Environment

All spills that occur in excess of the minimum reportable quantities described in Schedule B of the Spill Planning and Reporting Guidelines (Environmental Protection Act 1999), must be reported to GN-DoE via email (spills@gov.nt.ca) or via the 24-hour spill reporting line (1-867-920-8130).

5.10.2.3 Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program

Potential fisheries violations, due to Project construction must be reported to DFO through the Nunavut office (24-hour reporting hotline) at 867-777-7500. Violations could include HADD and death of fish not authorized in the FAA, or injury/mortality of SARA species.

5.10.2.4 Environment and Climate Change Canada

ECCC have authority over the MBCA, terrestrial SARA species, and Section 36(3) of the *Fisheries Act*.

Any harm, destruction, or disturbance to terrestrial SAR species (plants and animals), as well as birds, nests, or eggs are afforded protection under the MBCA will be considered reportable. Such events result in immediate notification to the Canadian Wildlife Service (CWS) branch of ECCC through the toll-free 24-hour reporting hotline at 1-800-668-6767 or through email (ec.enviroinfo.ec@canada.ca).

Deposit of deleterious substances are prohibited under Section 36(3) of the *Fisheries Act*, unless specifically authorized under a *Fisheries Act* regulation or by a regulation under other federal legislation. Any deposit whether made directly into water frequented by fish or indirectly must be immediately reported to ECCC's environmental notification system by calling the 24-hour telephone number for the region in which the event occurred. Deposit of deleterious substances associated with this Project should be reported to the

Government of the Northwest Territories Department of Environment and Natural Resources at 867-920-8130.

5.10.3 Regulatory Authority Reporting

Annual or end of construction reports will be required to be submitted to pertinent RAs (DFO-FFHPP, NWB, NIRB). DFO-SCH will be responsible for submitting the reports to RAs. DFO-SCH will confirm who is responsible for preparing the reports, whether it be the contractor's EM or the owners EI.

5.11 Communications

Communications with the community, stakeholders, and RAs will be required throughout the Project.

5.11.1 Regulatory Authorities

Communications with RAs will be undertaken by the permit holder. A DFO-SCH representative will be copied on regulatory communications for contractor held permits.

Non-compliance incident reporting protocol will be confirmed with the contractor prior to the start of construction.

5.11.2 Social Media, Website and Community Postings

Construction notices will be translated and at minimum be posted publicly on social media, community radio, VHF radio, the Hamlet, and the HTA office. The contractor will detail locations and timeline of where and when the construction notices will be posted within the CCEMP (see Section 5.3.3).

Daily blasting notices will be posted on radio, social media, hamlet, and on VHF radios for cabin owners at Victor Bay. Blasting will be timed to occur at the same time every day so that residents can plan accordingly.

Daily road closure notices will be posted on radio, social media, hamlet, and on VHF radios for cabin owners at Victor Bay.

5.11.3 Hamlet and Hunters and Trappers Association

The contractor will be required to provide the TMP CWP (see Section 5.3.2) to the Hamlet and HTA for their review and approval.

Continued consultation and coordination of construction activities with the HTA and Hamlet throughout construction.

5.12 Training and Competency

Training and competency measures will be in place to confirm that the contractor's staff are qualified for the tasks they undertake. Necessary training requirements are specified in Section 5.4.15.

The workforce will be comprised of skilled and semi-skilled labour including the following: heavy equipment operator; truck driver, driller, blaster, crane operator; welder; marine deckhand; tug operator; mechanic; electrician; and general labourers. Work rotations for non-local labour will be determined by the contractor and will comply with applicable Workers Safety and Compensation Commission (WSCC) regulations (WSCC 2021).

The Project will comply with the new Treasury Board *Directive on Government Contracts Including Real Property Leases, in the Nunavut Settlement Area* (Government of Canada 2019a) and aims to maximize participation of Inuit labour, training and Inuit owned businesses on the Project.

6 References

Advisian-Ikpiaryuk JV. (2020). Arctic Bay Harbour Development. Sediment Sampling and Analysis Plan. Prepared for Environment and Climate Change Canada on behalf of DFO-SCH and PSPC. 26 November 2020. Document No. 317071-00037-00-EN-PLN-0001.

Advisian-Ikpiaryuk JV. (2021a). Arctic Bay Harbour Development - Community Consultation Log. Prepared for Public Services and Procurement Canada (PSPC). *(Document No. 317071-00037-00-EN-REG-0001, Revision 0)* in progress.

Advisian-Ikpiaryuk JV. (2021b). Arctic Bay Harbour Development - Project Specific Information Requirements (PSIR) document. Prepared for Public Services and Procurement Canada and submitted to Nunavut Impact Review Board (NIRB). *(Document No. 317071-00037-PM-PMT-0003, Revision 0)* in progress.

Advisian-Ikpiaryuk JV. (2021c). Arctic Bay Harbour Development - Schematic Design Report. Prepared for Public Services and Procurement Canada and Fisheries and Oceans Canada – Small Craft Harbours. *(Document No. 317071-00037-00-MA-REP-0001, Revision A)* February 2021.

Aquatic Invasive Species Regulations. SOR/2015-121. Available at: https://laws-lois.justice.gc.ca/PDF/SOR-2015-121.pdf Enabling Act: *Fisheries Act*.

Arctic Waters Pollution Prevention Act. (1985). R.S.C. 1985, c. A-12 https://laws-lois.justice.gc.ca/PDF/A-12.pdf Last Amended August 7, 2019.

Arctic Waters Pollution Prevention Regulations. C.R.C., c. 354 https://laws-lois.justice.gc.ca/PDF/C.R.C., c. 354.pdf Enabling Act: *Arctic Waters Pollution Prevention Act*.

BC Marine and Pile Driving Contractors Association. (2003). Best Management Practices for Pile Driving and Related Operations. March 2003. Available at: https://a100.gov.bc.ca/appsdata/epic/documents/p351/d32211/1273516310337_a8f9af96262d9ff325e4452109b72a5c6e2c4828796e47dd8ed0c732bc322dfb.pdf Accessed: June 2020.

Canada Shipping Act. (2001). SC 2001, c26 http://laws-lois.justice.gc.ca/PDF/C-10.15.pdf Last Ammended February 26, 2015.

Canadian Construction Association. (2001). CCA 81 - 2001: A Best Practices Guide to Solid Waste Reduction.

Canadian Environmental Protection Act. (1999). S.C. 1999, c. 33. Current to March 5, 2020. http://laws-lois.justice.gc.ca/PDF/C-15.31.pdf.

Canadian Environmental Protection Act. (1999). S.C. 1999, c. 33. Current to May 19, 2021. Available at: http://laws-lois.justice.gc.ca/PDF/C-15.31.pdf. Last amended May 1, 2021.

Canadian Navigable Waters Act. (1985). R.S.C., 1985 c. N-22. Current to May 19, 2021. Available at: https://laws-lois.justice.gc.ca/PDF/N-22.pdf. Last amended October 4, 2019.

CCME. (1999). Canadian Council of Ministers of the Environment. Turbidity CCME Summary Table: Turbidity factsheet. Available at: http://st-ts.ccme.ca/en/index.html?lang=en&factsheet=219. Accessed July 2020.

Commissioners Land Act. (1988). R.S.N.W.T. 1988 c.C-11 https://www.justice.gov.nt.ca/en/files/legislation/commissioners-land/commissioners-land.a.pdf

Commissioners Land Regulations. R.R.N.W.T 1990, c- 13 https://www.justice.gov.nt.ca/en/files/legislation/commissioners-land/commissioners-land.r1.pdf Enabling Act: *Commissioners Land Act*.

Consolidation of Explosives Use Act. (1985). R.S.C. 1985, c. E-17 https://laws-lois.justice.gc.ca/PDF/E-17.pdf Last Amended February 26, 2015.

Consolidation of Fire Safety Act. (1988). R.S.N.W.T. 1988, c 7-6 https://www.canlii.org/en/nu/laws/stat/rsnwt-nu-1988-c-f-6/latest/rsnwt-nu-1988-c-f-6.html

Consolidation of Public Health Act. (2016). S. Nu. 2016, c. 13 https://www.nunavutlegislation.ca/consolidated-law/current?title=P.

Consolidation of Wildlife Protection Act. (2003). S. Nu. 2003, c.26 https://www.nunavutlegislation.ca/en/consolidated-law/current?title=W.

CSA. (2014). Emergency and continuity management program, Canadian Standards Association (CSA) Z1600-14. Available at: https://www.orderline.com/z1600-17-emergency-and-continuity-management-program Accessed: May 2021.

DFO. (2013). Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat. Available at: Projects Near Water - Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat (dfo-mpo.gc.ca) Accessed: February 2021.

DFO. (2019a). Fish and Fish Habitat Protection Policy Statement, August 2019. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/policy-politique-eng.html. Accessed: September 2019.

DFO. (2019b). Fisheries and Oceans Canada. Standards and Codes of Practice. Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/practice-practique-eng.html Accessed January 2021.

DFO. (2019c). Measures to Protect Fish and Fish Habitat. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html. Accessed: September 2019.

DFO. (2019d). Projects Near Water - Nunavut Restricted Activity Timing Windows for the Protection of Fish and Fish Habitat (dfo-mpo.gc.ca). Available at: https://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/nu-eng.html Accessed: February 2021.

Disposal at Sea Regulations. (2001). SOR/2001-275. Available at: http://laws-lois.justice.gc.ca/PDF/SOR-2001-275.pdf Last amended September 24, 2014. Enabling Act: *Canadian Environmental Protection Act*. doi:https://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=0A70E5EB-1

ECCC. (1990). Western and Northern Region. Guidelines for the Preparation of Hazardous Material Spill Contingency Plans. Available at: http://publications.gc.ca/collections/collection_2020/eccc/En83-16-90-91-4-eng.pdf Accessed: June 2021.

Environmental Protection Act. R.S.N.W.T. 1988, cE-7. Current to July 24 2013. https://www.gov.nu.ca/sites/default/files/rsnwt-nu-1988-c-e-7-part-1_0.pdf.

Environmental Protection Act. (1999). Consolidation of Spill Contingency Planning and Reporting Regulations. R-068-93. Available at: http://www.gov.nu.ca/sites/default/files/gnjustice2/justicedocuments/Consolidated%20Law/Origin

al/ENVIRONMENTAL%20PROTECTION%20ACT/633404216382987500-243762148-Reg558.pdf. 12p.

Explosives Act. R.S.C., 1985, c. E-17 http://laws-lois.justice.gc.ca/PDF/E-17.pdf Last Ammended February 26 2015.

Explosives Regulation 2013. SOR/2013-211 http://laws.justice.gc.ca/PDF/SOR-2013-211.pdf Last Ammended February 26 2015. Enabling Act: *Explosives Act*.

Explosives Use Act. R.S.N.W.T. 1988,c.E-10 http://www.wscc.nt.ca/sites/default/files/documents/Explosives%20Use%20Act%20NT%20EN%20FR.pdf.

Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations. (2001). SOR/2005-149. Available at: https://laws-lois.justice.gc.ca/PDF/SOR-2005-149.pdf Enabling Act: *Canadian Environmental Protection Act*. doi:https://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=0A70E5EB-1

Fisheries Act. (1985). RSC 1985, c F-14 http://laws-lois.justice.gc.ca/PDF/F-14.pdf Last Amended August 28, 2019.

GN. (2002). Environmental Guideline for Dust Suppression. Department of Susitanable Development Environmental Protection Service. January 2002. Available at: https://gov.nu.ca/sites/default/files/Guideline%20Dust%20Suppression.pdf Accessed: December 2020.

GN DoE. (1999). Guideline for the General Management of Hazardous Waste. Government of Nunavut, Department of Environment. Revised October 2010. Available at: https://www.gov.nu.ca/sites/default/files/Guideline%20-%20General%20Management%20of%20Hazardous%20Waste%20%28revised%20Oct%202010%29_0.pdf. Accessed: December 2020.

GN DoE. (2011). Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities. Available at: https://www.gov.nu.ca/sites/default/files/industrial_waste_discharges_2011.pdf Accessed: June 2021.

GN DoE. (2012). Environmental Guideline for Used Oil and Waste Fuel. Available at: https://www.gov.nu.ca/sites/default/files/guideline_-_used_oil_and_waste_fuel_final_2012-09.pdf Accessed: June 2021.

GNWT. (2015a). Northern Land Use Guidelines - Access: Roads and Trails. Goverment of Northwest Territories. ISBN: 978-0-7708-0233-2. Available at: https://www.lands.gov.nt.ca/sites/lands/files/resources/nlug_roadstrails_2015_english_16_sept_2015.pdf Accessed March 2021.

GNWT. (2015b). Northern Land Use Guidelines - Pits and Quarries. Goverment of Northwest Territories. ISBN: 978-0-7708-0231-8. Available at: https://www.lands.gov.nt.ca/sites/lands/files/resources/nlug_-_pits_and_quarries_-_16_september_2015.pdf Accessed March 2021.

Government of Canada. (2018a). General nesting periods of migratory birds. Available at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html Accessed February 2021.

Government of Canada. (2018b). Guidelines to avoid disturbance to seabird and waterbird colonies in Canada. Available at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/avoid-disturbance-seabird-waterbird-colonies-canada.html. Accessed February 2021.

Government of Canada. (2019a). Directive on Government Contracts, Including Real Property Leases, in the Nunavut Settlement Area. Available at: https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32610 Accessed: April 2021.

Government of Canada. (2019b). Guidelines to reduce risk to migratory birds. Available at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reduce-risk-migratory-birds.html. Accessed February 2021.

Government of Nunavut. (2002). Environmental Guideline for Dust Suppression. 15p. Department of Sustainable Development. Environmental Protection Service. January 2002. Available at: http://www.gov.nu.ca/sites/default/files/Guideline%20Dust%20Suppression.pdf

Government of Nunavut. (2003). Contingency Planning and Spill Reporting in Nunavut. A Guide to the New Regulations. Environmental Protection Service. Department of Sustainable Development. Available at: https://www.gov.nu.ca/sites/default/files/Spill%20Planning%20and%20Reporting%20Guide.pdf. Accessed: May 2021.

Government of Nunavut. (2010). Non-Native and Invasive Species in Nunavut. Government of Nunavut and Environment Canada. Available at: http://www.gov.nu.ca/sites/default/files/brochure_english_jan31-4_1.pdf. Accessed: May 2021.

Government of Nunavut. (2011). Non-native invasive species in Nunavut (brochure). Department of Environment. Available at: https://www.gov.nu.ca/environment/documents/non-native-invasive-species-nunavut-brochure. Accessed February 2021.

Health Canada. (2020). Workplace Hazardous Materials Information System (WHMIS). Available at: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/occupational-health-safety/workplace-hazardous-materials-information-system.html Accessed: June 2021.

IIBA. (2019). allurutiup Imanga National Marine Conservation Area. Inuit Impact and Benefit Agreement. August 1 2019. Available at: https://www.qia.ca/wp-content/uploads/2019/09/2019-08-01_TINMCA-IIBA_FULLY-SIGNED-1.pdf Accessed: November 2019.

IMO. (2020). International Maritime Dangerous Goods Code (IMDG) 2020. Available at: https://www.imo.org/en/publications/Pages/IMDG%20Code.aspx Accessed: June 2021.

INAC. (2008). Guidelines for Spill Contingency Planning. *Prepared by Water Resources Division Indian and Northern Affairs Canada, April 2008*(Available at: http://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-NWT/STAGING/texte-text/ntr_pubs_SCP_1330712728397_eng.pdf), 30p.

Interprovincial Movement of Hazardous Waste Regulations. (2001). SOR/2002-301. Available at: https://laws-lois.justice.gc.ca/PDF/SOR-2002-301.pdf Enabling Act: *Canadian Environmental Protection Act*. doi:https://www.ec.gc.ca/glaces-ice/default.asp?lang=En&n=0A70E5EB-1

Marine Mammal Regulations. SOR/93-56, Government of Canada. Available at: http://laws-lois.justice.gc.ca/PDF/SOR-93-56.pdf Last amended 02 November 2018. Enabling Act: *Fisheries Act*.

Migratory Birds Convention Act. (1994, December 10, 2010). SC 1994, c22. Current to March 5, 2020. http://laws-lois.justice.gc.ca/PDF/M-7.01.pdf.

Migratory Birds Regulations. C.R.C., c. 1035 http://laws-lois.justice.gc.ca/PDF/C.R.C.,_c._1035.pdf Last Ammended July 13 2016. Enabling Act: *Migratory Birds Convention Act, 1994*.

National Research Council Canada. (2015). National Fire Code of Canada 2015. ISBN 0-660-03629-8. Available at: https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada/codes-canada-publications/national-fire-code-canada-2015 Accessed April 2021.

NIRB. (2021). Abandonment and Restoration Plan. Available at: https://www.nirb.ca/portal/dms/script/dms_download.php?fileid=275921&applicationid=124229&sessionid=gvcdfnqct266j2th035rq3dnc5 Accessed: June 2021.

NOAA. (2018). 2018 Revision to the Technical Guidance for Assessing Effects of Anthropogenic Sound on Marine Hearing Available at: https://www.fisheries.noaa.gov/action/2018-revision-technical-guidance-assessing-effects-anthropogenic-sound-marine-mammal-hearing Accessed: March 2019.

NPC. (2000). North Baffin Regional Land Use Plan. Available at: http://www.nunavut.ca/files/North%20Baffin%20Regional%20Land%20Use%20Plan.pdf Accessed: February 2017.

Nunavut Act. S.C. 1993, c. 28 http://laws-lois.justice.gc.ca/PDF/N-28.6.pdf Last Ammended February 26 2015.

Nunavut Archaeological and Palaeontological Sites Regulations. SOR/2001-220 Available at: https://laws-lois.justice.gc.ca/PDF/SOR-2001-220.pdf Enabling Act: *Nunavut Act*.

Nunavut Land Claims Agreement Act. (1993). SC 1993, c 29. Available at: http://laws-lois.justice.gc.ca/PDF/N-28.7.pdf Last amended May 21, 2004.

Nunavut Planning and Project Assesment Act. S.C. 2013, c. 14, s. 2 http://laws-lois.justice.gc.ca/PDF/N-28.75.pdfLast Last Ammended July 9 2015.

Nunavut Water Regulations. SOR/2013-69. Available at: http://laws-lois.justice.gc.ca/PDF/SOR-2013-69.pdf Enabling Acts: *Nunavut Land Claims Agreement Act, Nunavut Waters and Nunavut Surface Rights Tribunal Act*.

Nunavut Waters and Nunavut Surface Rights Tribunal Act. (2002). S.C. 2002, c.10 https://laws-lois.justice.gc.ca/PDF/N-28.8.pdf Last Amended August 28, 2019.

Nunavut Waters and Water Surface Rights Tribunal Act. S.C. 2002, c. 10 http://laws-lois.justice.gc.ca/PDF/N-28.8.pdfLast Last Ammended June 16 2016.

Oil Pollution Prevention Regulations. S.O.R/2007-86 s.206. Available at: https://laws-lois.justice.gc.ca/PDF/SOR-93-3.pdf Last amended May 3, 2007. Enabling Act: *Canada Shipping Act*.

Species at Risk Act. (2002). S.C. 2002 C. 29, c F-14 https://laws-lois.justice.gc.ca/PDF/S-15.3.pdf Last Amended April 23, 2021.

Territorial Land Use Regulations. C.R.C., c. 1524 Available at: https://laws-lois.justice.gc.ca/PDF/C.R.C., c. 1524.pdf.

Territorial Lands Act. R.S.C., 1985, c. T-7 Available at: https://laws-lois.justice.gc.ca/PDF/T-7.pdf.

Transport Canada. (2019). National Oil Spill Preparedness and Response Regime. Available at: https://tc.canada.ca/en/marine-transportation/marine-safety/national-oil-spill-preparedness-response-regime-0. Accessed: June 2021

Transportation of Dangerous Goods Act 1992. S.C. 1992, c. 34 http://lois-laws.justice.gc.ca/PDF/T-19.01.pdf Last Ammended January 1 2017.

Wright, & Hopky. (1998). Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. *Can. Tech. Rep. Fish. Aquat. Sci., 2107*, iv + 34p.

WSCC. (2021). Workers Safety & Compensation Commission Legislation. Available at: https://www.wscc.nt.ca/about-wscc/policy-and-legislation/legislation#SafetyAct Accessed: January 2020.

Appendix 1 Project Mitigation Overlap