LNG CANADA
Opportunity for British Columbia. Energy for the world

Joint venture companies

LNG Canada
Canadian Environmental Assessment Agency
2018 – 2019 Annual Report

Table of Contents

Executive Summary

LNG Canada is building an LNG export facility (the Project) located in northwest British Columbia, in the District of Kitimat and the traditional territory of the Haisla Nation. The Project is comprised of a liquefied natural gas facility and supporting infrastructure, including LNG storage and marine loading facilities, and temporary construction-related infrastructure and facilities.

On June 17, 2015, LNG Canada received the Canadian Environmental Assessment Agency (CEAA) Decision Statement that established the conditions LNG Canada must comply with. This Annual Report provides information and updates related to those conditions, for the period April 1, 2018 to March 31, 2019 (known as the reporting year).

The Project represents a unique opportunity for British Columbia and Canada. On an annual basis, at full build out, the Project will convert Canada's abundant supply of natural gas to LNG for export to global markets.

LNG Canada is committed to executing a high standard of environmental management and compliance in all its activities. LNG Canada's Compliance Management System, a component of LNG Canada's Health, Safety, Security and Environmental Management System, details processes that are in place to ensure the conditions of the CEAA Decision Statement are documented, tracked and actioned. LNG Canada has retained the services of Haisla-Triton to provide environmental monitoring services for the Project.

LNG Canada continually re-evaluates mitigation and monitoring measures throughout construction to verify that construction activities remain in compliance with regulatory requirements and conform to Project commitments.

LNG Canada has adopted best-in-class technologies, is using state-of-the art design and engineering practices that exceed legislative requirements, and is working with the most credible and advanced suppliers of LNG industry technical solutions to deliver the Project.

1. Construction Activities within the Reporting Year

Late 2018 and early Q1 2019 saw increased activity on site in preparation of Final Investment Decision (FID). Activities primarily focused on water course isolation, fish salvage, tree clearing, site preparation and associated environmental monitoring activities. Late 2018 also saw the first entry into the marine environment, with active dredge related activities starting in November.

2. Community and Indigenous Groups Communications and Consultation

The commitment LNG Canada has made to transparent, frequent communications and consultation with Indigenous Groups and the Kitimat community, and the input we have in turn received, has been a vital component of the Project. LNG Canada's communications and

engagement program is premised on an adaptive management approach, where comments, concerns and questions can be received and responded to. LNG Canada shares information and seeks input through a range of initiatives – website, InFocus newsletter, Facebook page, telephone line and email, a Community Advisory Group, and open houses. The above information sharing initiatives have been designed with input from stakeholders, residents and Indigenous Groups

LNG Canada continued to adhere to the Community Feedback Process to provide an ongoing and transparent means for the community to raise questions, concerns and grievances, and have them addressed in a timely and consistent manner.

LNG Canada is committed to ensuring Indigenous Groups that may be impacted by the Project are engaged and consulted on applicable processes, activities, permits and conditions. LNG Canada's Senior Relationship Lead for each Indigenous Group provides a single point-of-contact. During the reporting year, Indigenous Groups were consulted during the development of several LNG Canada plans and processes.

3. Conditions Performance

The landscape surrounding the Project contains a range of terrestrial, aquatic and wetland habitats that support populations of wildlife and fish. These ecosystems are important not only to the health of the natural landscape, but also to residents and Indigenous Groups who rely on the environment for recreation and traditional use.

A) Fish and Amphibian Habitat and Salvage

In August 2018, minor modifications to one of the offsetting channels occurred under Fisheries Act Authorization 15-HPAC-00918 for the Workforce Accommodation Centre ("FAA1"). The intent of the modifications were to produce deeper pools at strategic locations within the channel to allow fish to hold during summer low flow periods. The success of this modification will be monitored and assessed during the effectiveness monitoring program for FAA1.

Within the reporting period, serious harm associated with FAA 16-HPAC-00220 ("FAA2") occurred in KRSC, Beaver Creek and Anderson Creek. The KRSC channel was isolated of flow from the Kitimat River at the upstream and downstream ends in preparation for clearing, grubbing, infilling and offset construction. Beaver Creek temporary diversion was constructed and commissioned to move flows around the future LNG storage tank area. Previous channel was cleared, and site preparations made for future construction. Flood protection berms were constructed along Anderson Creek to isolate several side channels.

Mitigation measures outlined in the marine FAA 15-HPAC-00585 and related application were adhered to during the dredge season, including the application of the September 1 – February 15 extended dredge window. A qualified environmental monitor was present during all in-water construction activities and dredging.

During the reporting year, fish salvage and relocation occurred during the isolation of KRSC, diversion of Beaver Creek Phase 1, site preparation activities and isolation of the intertidal zone for the LNG Canada DDS. During the reporting period, an approximate total of 147,520 fish were salvaged from the salvage areas. Fish species varied depending on the habitat types salvaged, and included salmonids, Stickleback and Lamprey. All salvaged fish were released into habitat of a similar type and quality, with consideration of future construction and salvage efforts to minimize double handling of fish species.

B) Wetlands

Within the reporting period, LNG Canada completed an assessment of wetlands adjacent to the Project construction footprint to establish a baseline of wetland function. Monitoring of wetlands adjacent to the construction footprint will continue annually until deemed no longer required.

LNG Canada's Wetland Compensation Plan has been designed for the implementation of wetland compensation measures as close to Kitimat as possible that reflect similar wetland type and functions to those lost. During the reporting year, specific locations for wetland compensation continued to be assessed. In late 2018, it was determined that one of the proposed wetland conservation candidate sites was already protected within an approved Wildlife Habitat Area (Grizzly Bear Habitat), and therefore should no longer be considered in LNG Canada's revised Wetland Compensation Plan. LNG Canada is now determining next steps, in consultation with Haisla Nation.

C) Migratory Birds

During the reporting year, LNG Canada made efforts to clear as much land as possible outside of the breeding bird window in an effort to alleviate disturbance to migratory birds. When clearing took place during bird breeding windows, LNG Canada completed pre-disturbance bird surveys to ensure that no potentially active nests were present within the active construction area, and any identified nests were subsequently protected by implementing buffer zones. Active nests are monitored from a distance to confirm and track the status and ensure that construction activities in the vicinity do not impact nesting or fledging. The buffer can only be removed once the Qualified Environmental Professional (QEP) has determined that the nest is no longer active, and no other nests exist.

During the reporting year, 56 pre-disturbance bird nest surveys were completed for the LNG Canada Project, and 12 active nests were identified. No incidental take of migratory birds or their nests took place during the reporting year.

D) Human Health

LNG Canada is committed to managing noise and air emissions during Project activities, and has taken steps to implement mitigations as appropriate through the development and implementation

of Environmental Management Plans. LNG Canada is in the process of implementing post-dredge follow-up programs as outlined in the LNG Canada Marine Monitoring Plan (MMP). .

E) Archaeological and Heritage Resources

LNG Canada has identified two potential areas of archaeological or cultural significance. No construction work took place in this reporting year near either of these sites. No chance find events took place during the reporting year.

F) Decommissioning

No decommissioning activities took place at the LNG Canada Project site during the reporting year.

G) Accidents or Malfunctions

There were no Accidents or Malfunctions at the LNG Canada Project during the reporting year.

Acronyms/Abbreviations

ACI	Air Curtain Incinerator
AIA	Archaeological Impact Assessment
BAT	Best Available Technology
BC	British Columbia
BCP1	Beaver Creek Phase I
BMP	Best Management Practice
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Agency
CAG	Community Advisory Group
CEMP	Construction Environmental Management Plan
CLISMP	Community Level Infrastructure and Services Management Plan
CMS	Compliance Management System
CRA	Commercial, Recreational or Aboriginal Fishery
CVL	Cedar Valley Lodge
CWS	Canada Wildlife Service
DAS	Disposal at Sea
DDS	Dredgeate Disposal Site
DEMP	Dredge Environmental Management Plan
DFO	Fisheries and Oceans Canada
DMR	Dual Mixed Refrigerant
DOK	District of Kitimat
EAC	Environmental Assessment Certificate (BC)
EAO	Environmental Assessment Office (BC)
ECCC	Environment and Climate Change Canada
EM	Environmental Monitor
EMA	Emergency Management Act (BC)
EMP	Environmental Management Plan
EOF	Early Offloading Facility
EPC	Engineering, Procurement and Construction
ERP	Emergency Response Plan

ESC	Erosion and Sediment Control
EWP	Environmental Work Plan
ENV	Ministry of Environment and Climate Change Strategy (BC)
FAA	Fisheries Act Authorization
FAA1	Fisheries Act Authorization – LNG Canada Workforce Accommodation Centre (15-HPAC-00918)
FAA2	Fisheries Act Authorization – LNG Processing Facility (16-HPAC-00220)
FAA3	Fisheries Act Authorization – Supporting Infrastructure (16-HPAC-01079)
FAA Marine	Fisheries Act Authorization – LNG Canada (15-HPAC-00585)
FID	Final Investment Decision
FLNRO	Forests, Lands and Natural Resource Operations (BC)
HCA	Heritage Conservation Act (BC)
HIP	Heritage Inspection Permit
HSSE	Health, Safety, Security and Environment
HSSE MS	HSSE Management System
ICS	Incident Command System
IEE	Integrated Engineering Environment
IFC	Issued for Construction
IL-	Below Industrial Land Use Criteria (in context of dredgeate handling)
IL+	Above Industrial Land Use Criteria (in context of dredgeate handling)
JFJV	JGC Fluor (LNG Canada EPC Contractor)
KRSC	Kitimat River Side Channel
LNG	Liquefied Natural Gas
LWD	Light Woody Debris
MAP	Marine Activities Plan
MATMP	Marine Access Traffic Management Plan
MMEZ	Marine Mammal Exclusion Zone
MMO	Marine Mammal Observer / Marine Mammal Observation
MMP	Marine Monitoring Plan
MOF	Material Offloading Facility
OGAA	Oil and Gas Activities Act (BC)
OGC	Oil and Gas Commission (BC)

OPP	Oceans Protection Plan
STL	Shovel Test Location
TSS	Total Suspended Solids
QEP	Qualified Environmental Professional

Concordance Table

Section Topic	Description	Clause	Sub clause	Report Section
CEAA Decision Statement				
Decision on environmental effects referred to in subsection 5(1) of CEAA 2012	In accordance with paragraph 52(1)(b) of CEAA 2012, after considering the report of the EAO on the Designated Project and the implementation of mitigation measures that I consider appropriate, I determined that the Designated Project is not likely to cause significant adverse environmental effects referred to in subsection 5(2) of CEAA 2012. In accordance with subsection 53(2) of CEAA 2012, I have established the conditions below in relation to the environmental effects referred to in subsection 5(2) of CEAA 2012, with which LNG Canada Development Inc. must comply.	NA	NA	1.0
Decision on environmental effects referred to in subsection 5(1) of CEAA 2012	These conditions are established for the sole purpose of the Decision Statement issued under the Canadian Environmental Assessment Act, 2012. They do not relieve the Proponent from any obligation to comply with other legislative or other legal requirements by the federal, provincial or local governments. Nothing in this Decision Statement shall be construed as reducing, increasing, or otherwise affecting what may be required to comply with all applicable legislative or other legal requirements.	NA	NA	1.0 1.3
General Conditions	The Proponent shall, throughout all phases of the Designated Project, ensure that its actions in meeting the conditions set out in this Decision Statement are informed by the best available information and knowledge, are based on validated methods and models, are undertaken by qualified individuals, and have applied the best available economically and technologically feasible strategies.	2.1	2.1	1.1 1.2 2.0 2.1
General Conditions	The Proponent shall, where consultation is a requirement of a condition set out in this Statement: provide written notice of the opportunity for the party or parties to present their views on the subject of the consultation; • provide sufficient information and a reasonable period of time to permit the party or parties to prepare their views; • provide a full and impartial consideration of any views presented; • and advise the party or parties that have provided comments on how the views and information received have been considered.	2.2	2.2.1	4.0
General Conditions	The Proponent shall, where consultation with Aboriginal groups is a requirement of a condition set out in this Decision Statement, and prior to the initiation of consultation, communicate with each Aboriginal group on the most appropriate manner in which to satisfy the consultation requirements referred to in condition 2.2.	2.3	2.3	4.8

Section Topic	Description	Clause	Sub clause	Report Section
General Conditions	The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement undertake monitoring and analysis to verify the accuracy of the environmental assessment as it pertains to the condition and/or to determine the effectiveness of any mitigation measure(s); • where the results of the monitoring and analysis indicate issues with respect to the accuracy of the environmental assessment or the effectiveness of any mitigation measures that may lead to adverse environmental effects, identify the means by which it will determine whether additional mitigation measures are required, including the need for consultation with other parties in reaching that determination; and • implement additional mitigation measures, as appropriate	2.4	2.4.1 2.4.2 2.4.3 2.4.4	2.3
General Conditions	The Proponent shall, from the reporting year where construction starts, submit to the Agency an annual report, including an executive summary of the annual report in both official languages. The annual report is to be submitted by the Proponent no later than June 30 following the reporting year. The Proponent shall document in the report: • implementation activities undertaken in the reporting year for each of the conditions; • how it has considered and incorporated the factors set out in condition 2.1 in the implementation of the conditions set out in this Decision Statement; for conditions set out in this Decision Statement for which consultation is a requirement, how it has considered any views and information received during or as a result of the consultation; • the results of the follow-up program requirements identified in conditions 3.14 , 4.2.4, 2.5.4,4.5, 5.3, 6.3.6 and 7.2; and • any additional mitigation measures implemented or proposed to be implemented, as determined under condition 2.4	2.5	2.5.1 2.5.2 2.5.3 2.5.4 2.5.5	1.4
General Conditions	The Proponent shall publish on the Internet, or any similar medium, the annual report, the executive summary referred to in condition 2.5, the Wetland Compensation Plan referred to in condition 4.3, the plan to offset the loss of fish and fish habitat referred to in condition 3.11, the Archaeological and Heritage Resources Management Plan referred to in condition 8.1, the Decommissioning Plan referred to in condition 9.1, and the implementation schedule referred to in condition 11, following submission of these documents to the parties referenced in the respective conditions. The Proponent shall keep these documents publicly available for twenty-five years following the end of operation or until the end of decommissioning of the Designated Project, whichever comes first.	2.6	2.6	1.4 4.3
General Conditions	The Proponent shall notify the Agency in writing no later than 60 days after the day on which there is a transfer of ownership, care, control or management of the Designated Project in whole or in part.	2.7	2.7	2.5

Section Topic	Description	Clause	Sub clause	Report Section
General Conditions	In the event that there is a transfer of ownership, care, control or management of the Designated Project from LNG Canada Development Inc. to another party, that party becomes the Proponent of the Designated Project and is bound by the conditions found in this Decision Statement.	2.8	2.8	2.5
Fish and Fish Habitat	The Proponent shall implement erosion control measures and sediment control measures during all phases of the Designated Project.	3.1	3.1	2.3
Fish and Fish Habitat	The Proponent shall revegetate disturbed riparian areas, using native vegetation, as soon as practicable after construction.	3.2	3.2	2.3
Fish and Fish Habitat	The Proponent shall isolate construction activities from adjacent freshwater fish habitat.	3.3	3.3	6.0 6.2
Fish and Fish Habitat	The Proponent shall salvage and relocate fish during in-water work requiring isolation of freshwater fish habitat.	3.4	3.4	6.0 6.2
Fish and Fish Habitat	The Proponent shall design the water intake for the Designated Project to avoid or reduce injury to and mortality of fish, including the risk of entrainment of eulachon larvae. The Proponent shall install the water intake that is so designed and shall monitor the operation of that intake to determine whether or not injury to and mortality of fish is avoided or reduced. Based on the monitoring results, the Proponent shall, as appropriate, modify the water intake or implement other measures to avoid or reduce injury to and mortality of fish.	3.5	3.5	6.0
Fish and Fish Habitat	The Proponent shall apply low-noise methods or sound dampening technologies to reduce adverse effects to fish from exposure to underwater noise during pile installation.	3.6	3.6	6.1
Fish and Fish Habitat	The Proponent shall, prior to the start of in-water construction activities; establish the location and timing of sensitive life stages and habitat occupancy for fish (including marine mammals) in consultation with Fisheries and Oceans Canada and Aboriginal groups; advise the Agency of that information; and shall conduct in-water construction activities during the timing windows of least risk to those life stages and habitat occupancy, unless otherwise authorized by Fisheries and Oceans Canada.	3.7	3.7	6.1
Fish and Fish Habitat	When conducting in-water construction activities outside the timing windows of least risk referred to in condition 3.7, the Proponent shall implement additional mitigation measures following consultation with Fisheries and Oceans Canada, including sediment containment when dredging and using sediment disposal methods and equipment that will limit re-suspension of sediments.	3.8	3.8	6.1
Fish and Fish Habitat	To avoid detrimental behavioral change in or injury to marine mammals, the Proponent shall establish and maintain a marine mammal exclusion zone for all construction activities where underwater noise levels are anticipated to exceed 160 decibels at a reference pressure of one micropascal. In doing so, the Proponent shall:	3.9	3.9.1 3.9.2 3.9.3	6.1

Section Topic	Description	Clause	Sub clause	Report Section
	identify the construction activities that generate underwater noise levels greater than 160 decibels and the periods of time when those activities will occur; • establish the boundary of the exclusion zone for each construction activity at the distance from the activity that the underwater noise level reaches 160 decibels; • employ a marine mammal observer and specify the role of that person in observing and reporting marine mammals in the exclusion zone during construction activities identified in condition 3.9.1; • specify the circumstances in which construction activities identified in condition 3.9.1 must stop or not start if a marine mammal is sighted in the exclusion zone by the observer referred to in condition 3.9.3 and not re-start until the marine mammal has moved out of the exclusion zone; and • specify mitigation measures, such as sound dampening technology and soft-start procedures to reduce construction noise levels in the exclusion zone.		3.9.4 3.9.5	
Fish and Fish Habitat	LNG carriers associated with the Designated Project shall respect speed profiles applicable to the operation of the Designated Project, subject to navigational safety, to prevent or reduce the risks of collisions between LNG carriers and marine mammals and shall report any collision with marine mammals to Fisheries and Oceans Canada, and notify Aboriginal groups.	3.10	3.10	6.1
Fish and Fish Habitat	The Proponent shall mitigate impacts to fish and fish habitat and, in consultation with Fisheries and Oceans Canada, develop and implement a plan to offset the loss of fish and fish habitat associated with the carrying out of the Designated Project.	3.11	3.11	6.3
Fish and Fish Habitat	For any fish habitat offsets area proposed in any offsetting plan under condition 3.11, and prior to submitting the offsetting plan to Fisheries and Oceans Canada, the Proponent shall determine whether there are adverse effects: • on migratory birds and their habitats; • on terrestrial species, including amphibians and reptiles, and their habitats; • on species at risk and their habitat; • on the current use of lands and resources for traditional purposes by Aboriginal peoples; • on navigation; • from potential sources of contamination including polycyclic aromatic hydrocarbons, dioxins, furans, copper and zinc on the receiving environment.	3.12	3.12.1 3.12.2 3.12.3 3.12.4 3.12.5 3.12.6	6.3
Fish and Fish Habitat	The Proponent shall, if there are adverse effects on any of the elements of condition 3.12, avoid or lessen those adverse effects.	3.13	3.13	6.3

Section Topic	Description	Clause	Sub clause	Report Section
Fish and Fish Habitat	In consultation with Fisheries and Oceans Canada and Aboriginal groups, the Proponent shall develop and implement a follow-up program to verify the accuracy of the environmental assessment and to determine the effectiveness of mitigation measures identified under conditions 3.1 to 3.11 and 3.13.	3.14	3.14	6.1 6.2 6.3
Fish and Fish Habitat	The Proponent shall participate in regional initiatives relating to cumulative effects monitoring and the management of marine shipping, should there be any such initiatives during the construction and operation phases of the Designated Project.	3.15	3.15	3.0
Wetlands	The Proponent shall mitigate the adverse environmental effects of the Designated Project on wetland functions that support migratory birds, species at risk or the current use of lands and resources for traditional purposes by Aboriginal people. The Proponent shall give preference to avoiding the loss of wetlands over minimizing the adverse effects on wetlands and for managing the effects on wetlands over compensating for lost or adversely affected wetlands.	4.1	4.1	7.0 8.0
Wetlands	To avoid loss of wetlands or to manage adverse effects on wetlands impacted by the Designated Project footprint and adverse effects on wetland function on and for those wetlands adjacent to the Designated Project footprint, the Proponent shall: • delineate clearing boundaries prior to the commencement of construction and respect those boundaries during construction; • maintain, where practicable, tidal flow and wildlife passage in the LNG loading line corridor between the LNG processing and storage site and the marine terminal; • manage surface water and avoid erosion or sedimentation to maintain hydrology of adjacent wetlands and protect water quality; and • conduct follow-up monitoring prior to and during construction to detect potential unanticipated loss of wetland functions and implement adjustments to mitigate loss of those wetland functions.	4.2	4.2.1 4.2.2 4.2.3 4.2.4	7.1
Wetlands	For effects on ecologically important wetlands that cannot be avoided or minimized, mitigation measures shall be set out in a Wetland Compensation Plan that shall be prepared by the Proponent in consultation with Aboriginal groups. The mitigation measures to be set out in the Wetland Compensation Plan shall include: • implementing a 2:1 ratio of compensation area to the loss of ecologically important wetland area; • identifying sites to compensate for the lost wetlands referred to in 4.3.1, that are as close to Kitimat as possible and that reflect similar wetland types and functions to those that are lost; • a preference for wetland restoration over enhancement, and wetland enhancement over creation; and	4.3	4.3.1 4.3.2 4.3.3 4.3.4	7.2

Section Topic	Description	Clause	Sub clause	Report Section
	• whenever possible, using traditional plants in the enhancement or creation of the compensation sites referred to in 4.3.2 and providing access to those sites to Aboriginal people for the purposes of gathering traditional use plants.			
Wetlands	The Proponent shall implement the wetland compensation plan within five years of the date of the start of construction	4.4	4.4	7.2
Wetlands	The Proponent shall implement a follow-up program to verify that the compensation wetland sites are fulfilling the functions of the wetlands they are replacing and shall implement corrective actions in respect of the compensation wetlands if the latter do not fulfill those functions. The follow-up program shall include monitoring of the compensatory wetland sites to verify that lost habitat is being restored at or on those sites, in year one, and in years three, five, and ten following the enhancement or creation of the compensating wetlands.	4.5	4.5	7.2
Migratory Birds	The Proponent shall carry out all phases of the Designated Project in a manner that protects and avoids harming, killing or disturbing migratory birds or destroying or taking their nests or eggs. In this regard, the Proponent shall take into account Environment Canada's Avoidance Guidelines. The Proponent's actions in applying the Avoidance Guidelines shall be in compliance with the Migratory Birds Convention Act, 1994 and with the Species at Risk Act.	5.1	5.1	8.0
Migratory Birds	The Proponent shall: • restrict flaring of vented emissions to the minimum required for maintenance activities or to manage emergencies; • minimize flaring during night time and during periods of bird vulnerability; and • adjust operational lighting to avoid attracting migratory birds.	5.2	5.2.1 5.2.2 5.2.3	8.0
Migratory Birds	The Proponent shall develop and implement a follow-up program to determine the effectiveness of the mitigation measures used to avoid harm to migratory birds, their eggs and nests during all phases of the Designated Project.	5.3	5.3	8.0
Migratory Birds	The Proponent shall avoid or lessen, and monitor effects on the habitat of the Marbled Murrelet (Brachyramphus marmoratus), a species that appears on Schedule 1 of the Species at Risk Act. The Proponent shall compensate for the loss of habitat of the Marbled Murrelet as a result of the Designated Project, taking into account Environment Canada's Operational Framework for Use of Conservation Allowances.	5.4	5.4	8.0
Human Health	The Proponent shall incorporate noise and air emission reduction measures in the design of the Designated Project, and implement noise and air emission reduction measures during all phases of the Designated Project to avoid or reduce potential effects on human health, including:	6.1	6.1.1 6.1.2 6.1.3	9.0

Section Topic	Description	Clause	Sub clause	Report Section
	• complying with the Waste Discharge Regulation under British Columbia's Environmental Management Act for operational air emissions; • applying best management practices and guidance for construction noise from the British Columbia Oil and Gas Commission's Noise Control Best Practices Guidelines; and • complying with the operational noise requirement of the British Columbia Oil and Gas Commission's Liquefied Natural Gas Facility Regulation.			
Human Health	The Proponent shall develop and implement a mechanism for receiving noise complaints, in consultation with Aboriginal groups and other parties who may be adversely affected by the noise caused by the Designated Project and during all phases of the Designated Project, and respond in a timely manner to any noise complaint received.	6.2	6.2	9.1
Human Health	The Proponent shall implement measures related to marine water quality and sediment quality, including: • prior to the commencement of dredging, establishing a shellfish and groundfish tissue baseline and using it to complete a human health risk assessment for the consumption of fish; • conducting an assessment of the risks and potential duration of any exceedances of Canadian Council of Ministers of the Environment's Water Quality and Interim Sediment Quality Guidelines, and British Columbia's Water Quality Guidelines and Working Sediment Quality Guidelines that could occur during dredging and other in-water construction activities, and identify mitigation measures to avoid such exceedances; • implementing mitigation measures to minimize sediment dispersion during in-water construction activities, including isolation methods; • conducting onsite sediment and water quality monitoring in relation to the re-suspension and bioavailability of polycyclic aromatic hydrocarbons, dioxins and furans during in-water construction activities; • communicating any exceedances of the Canadian Council of Ministers of the Environment's Water Quality and Interim Sediment Quality Guidelines, and British Columbia's Water Quality Guidelines and Working Sediment Quality Guidelines to regulatory authorities in accordance with legislative requirements and to Aboriginal groups, and implementing mitigation measures identified in condition 6.3.2 to remedy those exceedances or to reduce associated risks to human health; • developing and implementing a post-dredging follow-up program, in consultation with Aboriginal groups, to confirm the human health risk assessment predictions, including additional sampling of the shellfish and groundfish tissue to confirm the assessment predictions regarding the bioavailability and bioaccumulation of contaminants in fish consumed by humans. The Proponent shall communicate the results of the follow-up program to Aboriginal groups.	6.3	6.3.1 6.3.2 6.3.3 6.3.4 6.3.5 6.3.6	9.2

Section Topic	Description	Clause	Sub clause	Report Section
Human Health	The Proponent shall, during operation, treat any effluent discharge from the facility marine outfall pipe to meet subsection 36(3) of the Fisheries Act and British Columbia's Water Quality Guidelines for the protection of marine life measured at the edge of the initial dilution zone.	6.4	6.4	9.2
Current use of lands and resources for traditional purposes	The Proponent shall develop and implement, in consultation with Aboriginal groups, a communication protocol for all phases of the Designated Project. The communication protocol shall include procedures and practices for sharing information and facilitating communication between the Proponent and the Aboriginal groups and other local marine users on the following: • location and timing of Designated Project-related construction activities; • location and timing of traditional activities by Aboriginal groups; • safety procedures, such as navigation aids and updated navigational charts; • location of areas where navigation is restricted for safety reasons; • operational speed requirements under the Canada Shipping Act, 2001 or its regulations, and general schedules of the operation of LNG carriers associated with the Designated Project; • ways in which to provide feedback to the Proponent on adverse effects related to navigation experienced by Aboriginal groups and other local marine users.	7.1	7.1.1 7.1.2 7.1.3 7.1.4 7.1.5 7.1.6	10.0 10.1 10.2
Current use of lands and resources for traditional purposes	The Proponent shall develop and implement, in consultation with Aboriginal groups, a follow-up program to verify the accuracy of the predictions made during the environmental assessment in relation to the effects of the wake generated by the Designated Project on the current use of lands and resources for traditional purposes by Aboriginal groups. The follow-up program shall include: • monitoring during the first two years of operation of the degree of wake generation by Designated Project-related vessels and of any adverse effects on harvesters caused by vessel wake attributable to Designated Project-related vessels at key harvest sites and during key harvest periods identified in consultation with Aboriginal groups; and • providing the results of the follow-up program and any corrective actions taken to Aboriginal groups.	7.2	7.2.1 7.2.2	10.0
Current use of lands and resources for traditional purposes	The Proponent shall provide Aboriginal groups with the implementation schedule, updates or revisions to the implementation schedule pursuant to condition 11 at the same time these documents are provided to the Agency.	7.3	7.3	2.2
Physical and cultural heritage and structure, site or thing of historical,	The Proponent shall, in consultation with Aboriginal groups and local historical societies, develop and implement an Archaeological and Heritage Resources Management Plan for the Designated Project prior to construction. The Archaeological and Heritage Resources Management Plan shall take into	8.1	8.1.1 8.1.2 8.1.3	10.0

Section Topic	Description	Clause	Sub clause	Report Section
archaeological, paleontological or architectural significance	account British Columbia's Handbook for the Identification and Recording of Culturally Modified Trees. The Archaeological and Heritage Resources Management Plan shall include: • a description of structures, sites or things of historical, archaeological, paleontological or architectural significance (including Culturally Modified Trees) that may be encountered by the Proponent during construction; • a description of structures, sites or things of historical, archaeological, paleontological or procedures and practices for on-site monitoring of construction activities that may affect a structure, site or thing of historical, archaeological, paleontological or architectural significance (including Culturally Modified Trees) and for the identification and removal of these resources; and • a Chance Find Protocol if a previously unidentified structure, site or thing of historical, archaeological, paleontological or architectural significance (including Culturally Modified Trees) is discovered by the Proponent or brought to the attention of the Proponent by an Aboriginal group or another party during construction.			
Decommissioning	The Proponent shall develop and submit to the Agency a Decommissioning Plan at least one year prior to the end of operation, consistent with any statutory or regulatory requirements in effect at that time. The Decommissioning Plan shall include a description of: • any consultation undertaken during the development of the Decommissioning Plan, including any issues raised by Aboriginal groups and other parties and how they were resolved by the Proponent; • the components of the Designated Project that will be decommissioned by the Proponent; • the desired end-state objectives of the areas that will be decommissioned by the Proponent and those that will not be decommissioned; • the components of the environment that may be adversely affected by decommissioning activities or by components of the Designated Project that continue in their state at the end of operation; • how the Proponent will monitor and mitigate adverse environmental effects from decommissioning activities; • how the Proponent will conduct in-water and land-based decommissioning activities (including the location, the scheduling and sequencing of activities); • a strategy for progressive reclamation, if appropriate; and • an approach to consulting Aboriginal groups and federal and provincial authorities throughout the decommissioning phase.	9.1	9.1.1 9.1.2 9.1.3 9.1.4 9.1.5 9.1.6 9.1.7 9.1.8	2.4

Section Topic	Description	Clause	Sub clause	Report Section
Decommissioning	The Proponent shall from the reporting year in which decommissioning begins until the end of decommissioning, submit to the Agency a written report no later than June 30 of the following reporting year. The written report shall include a description of: • the decommissioning activities that took place during the reporting year; • any adverse environmental effects identified by the proponent with respect to those decommissioning activities; • a description of the mitigation measures that were implemented by the Proponent to mitigate or reduce those adverse effects, and consultation activities.	9.2	9.2.1 9.2.2 9.2.3 9.2.4	2.4
Accidents or Malfunctions	The Proponent shall take all reasonable measures to prevent accidents and malfunctions that may result in adverse environmental effects and shall implement the emergency response procedures and contingencies developed in relation to the Designated Project.	10.1	10.1	5.0
Accidents or Malfunctions	In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall: • notify relevant federal and provincial authorities, including the Agency of the occurrence as soon as possible; • implement measures to minimize any adverse environmental effects associated with the occurrence as soon as possible; • submit a written report to the Agency as soon as possible in the circumstances, but at the latest 30 days after the day on which the accident or malfunction took place. The written report must include: • 10.2.3.1 the measures that were taken to mitigate the effects of the occurrence; 10.2.3.2 a description of any residual environmental effects, and any additional measures required to address residual environmental effects; and 10.2.3.3 if an emergency response plan was implemented, details concerning its implementation. • as soon as possible, but no later than 90 days after the day on which the accident or malfunction took place, submit a written report to the Agency on the changes made to avoid a subsequent occurrence of the accident or malfunction.	10.2	10.2.1 10.2.2 10.2.3 10.2.4	5.1
Accidents or Malfunctions	The Proponent shall prepare and implement a communication strategy in consultation with Aboriginal groups that shall include: • the types of accident or malfunction requiring a notification to the respective Aboriginal groups; • the manner by which Aboriginal groups shall be notified of an accident or malfunction and of any opportunities to assist in the response; and • points of contact for the Proponent and for the respective Aboriginal groups.	10.3	10.3.1 10.3.2 10.3.3	5.2

Section Topic	Description	Clause	Sub clause	Report Section
Implementation Schedule	The Proponent shall submit an implementation schedule for conditions contained in this Decision Statement to the Agency, or anyone designated pursuant to section 89 of the Canadian Environmental Assessment Act, 2012, at least 30 days prior to construction. The implementation schedule shall indicate the commencement and completion dates for each activity relating to conditions set out in this Decision Statement.	11.1	11.1	2.2
Implementation Schedule	The Proponent shall submit an update to this implementation schedule in writing to the Agency, or anyone designated pursuant to section 89 of the Canadian Environmental Assessment Act, 2012, every two years on or before June 30, until completion of the activities.	11.2	11.2	2.2
Implementation Schedule	The Proponent shall provide the Agency, or anyone designated pursuant to section 89 of the Canadian Environmental Assessment Act, 2012, with a revised implementation schedule if any change occurs from the initial schedule or any subsequent updates. The Proponent shall provide the revised implementation schedule at least 30 days prior to the implementation of the change.	11.3	11.3	2.2
Record Keeping	The Proponent shall maintain a written record, or a record in an electronic format compatible with that used by the Agency, and retain and make available that record to the Agency, or anyone designated pursuant to section 89 of the Canadian Environmental Assessment Act, 2012, at a facility close to the Designated Project (local facility). The record shall include information related to the implementation of the conditions set out in this Decision Statement, and the results of all monitoring, including: the place, date and time of any sampling, as well as techniques, methods or procedures used; the dates and the analyses that were performed; • the analytical techniques, methods or procedures used in the analyses; • the names of the persons who collected and analyzed each sample and documentation of any professional certifications relevant to the work performed that they might possess; and • the results of the analyses.	12.1	12.1.1 12.1.2 12.1.3 12.1.4 12.1.5	2.6
Record Keeping	The Proponent shall retain and make available upon demand to the Agency, or anyone designated pursuant to section 89 of the Canadian Environmental Assessment Act, 2012, the information contained in condition 12.1 at a facility close to the Designated Project (or at a location within Canada and agreed upon by the Agency, should the local facility no longer be maintained). The information shall be retained and made available throughout construction and operation, and for twenty-five years following the end of operation or until the end of decommissioning of the Designated Project, whichever comes first.	12.2	12.2	2.6

1. Introduction

LNG Canada is building an LNG export facility (the Project) located in northwest British Columbia, in the District of Kitimat and the traditional territory of the Haisla Nation. The Project is comprised of a liquefied natural gas facility and supporting infrastructure, including LNG storage and marine loading facilities, and temporary construction-related infrastructure and facilities. LNG Canada is committed to planning, constructing and operating the Project in a manner that respects surrounding communities and the environment.

On June 17, 2015, LNG Canada was issued a Decision Statement under Section 52(1)(b) of the Canadian Environmental Assessment Act, 2012 ("CEAA Decision Statement"), establishing conditions to which LNG Canada must comply. This annual report serves to provide information and updates related to those conditions.

1.1. Project Overview

The Project will be located on approximately 400 hectares of land within Kitimat, on land zoned for industrial use. At full build out, the LNG Canada facility will be comprised of a variety of buildings and equipment used to process and store LNG. Supporting infrastructure will also be in place, including power supply, water supply, and waste collection and treatment facilities.

The Project is located in the traditional territory of the Haisla Nation and the associated Operational shipping route passes through the traditional territories of Haisla Nation, Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams First Nation and Metlakatla First Nation.

Initially, the project will consist of two LNG processing units referred to as "trains,", with an option to expand the project in the future to four trains. The Project is expected to have a life of at least 40 years.

To facilitate construction, existing and temporary facilities will be utilized. Cedar Valley Lodge (CVL), LNG Canada's temporary workforce accommodation centre, is anticipated to house construction staff on approximately 64 hectares of land immediately adjacent to the future site of the LNG processing and storage site.

On July 11, 2016, LNG Canada announced a delay in Final Investment Decision (FID) with the hope of achieving FID in late 2018. Throughout 2018, LNG Canada was focused on completing necessary works in the event of a positive FID, which occurred in October 2018.

In early 2019, LNG Canada's Engineering, Procurement and Construction (EPC) Contractor, JGC Fluor (JFJV), took over primary responsibility for implementation of environmental programs and

controls identified in permits, approvals, authorizations and associated management plans during construction.

This Annual Report provides further information on the processes and mitigations put in place by LNG Canada and the EPC contractor JFJV to ensure that Project activities are carried out in accordance with regulatory conditions.

1.2. HSSE, Social Performance and Compliance Principles

LNG Canada is committed to a high standard of environmental management and compliance through all phases of the Project.

LNG Canada's Environmental Philosophy is to protect the environment by minimizing potential impacts, including minimizing greenhouse gas emissions from the proposed facility. LNG Canada commits to compliance with existing regulations, permits, approvals, authorizations and related management plan requirements, and to align environmental, community and social performance commitments into engineering design and construction decisions.

LNG Canada has implemented a Project-specific environmental management program that includes a series of environmental management plans to protect the environment, personnel and the public. LNG Canada commits to publicly reporting on environmental and safety performance.

LNG Canada is committed to ensuring that processes in place to meet conditions of the CEAA Decision Statement are informed by the best available technology (BAT) and based on validated methods and models. Commitments to BAT are demonstrated in several ways through design and execution of the Project. Examples include:

- Use of existing infrastructure, such as BC Hydro supplied grid with hydroelectric power output for auxiliary power requirements to ensure the lowest feasible greenhouse gas footprint;
- Shell's Dual-Mixed Refrigerant (DMR) technology process in combination with high efficiency General Electric aero derivative gas turbines (LMS 100) and recovery of waste heat;
- Use of existing industrial development area for the LNG Plant site and refurbishing existing harbour infrastructure where feasible during marine construction;
- Adoption of best-in-class LNG Plant simplicity, utilizing the lowest equipment count per LNG capacity;
- Implementation of mitigations and associated sampling programs that prescribe to the most up-to-date standards and methods recognized by government and industry;
- Implementation of an Integrated Engineering Environment (IEE) for plant design to minimize process safety risks throughout the life of the Project; and

- Adoption of state-of-the-art design and engineering practices that exceed requirements laid out in legislation.

1.3. HSSE Management System

The LNG Canada Health, Safety, Security and Environmental Management System (HSSE MS) provides a systematic HSSE structure composed of a framework, policies, standards, guidelines, premises, specific plans, procedures and processes. The HSSE MS:

- describes the Organization, Activities, Processes, Controls and Procedures for identifying and managing HSSE & SP risks for the Project;
- demonstrates how HSSE & SP will be managed, reviewed and continuously improved;
- demonstrates how the Federal, Provincial and Local regulatory, contractual and LNG Canada HSSE & SP requirements are being met and incorporated into systems, plans and procedures; and
- identifies the necessary actions to set up and implement the HSSE MS.

The LNG Canada Compliance Management System (CMS), a component of the HSSE MS, details processes in place at LNG Canada to ensure that conditions of the LNG Canada CEAA Decision Statement, as well as requirements in LNG Canada permits and approvals, are documented, tracked and actioned.

1.4. Report Requirements

This CEAA Annual Report demonstrates the commitment that LNG Canada has made to responsible health, safety, environment and social performance throughout the life of the Project. It provides an overview of the progress on meeting conditions outlined in CEAA Decision Statement.

As per the CEAA Decision Statement, for the purposes of this report, the reporting year is defined as April 1, 2018 to March 31, 2019.

The LNG Canada CEAA Annual Report can be accessed at the LNG Canada website (www.lngcanada.ca).

2. Construction Update

2.1. Activities within the Reporting Year

Late 2018 and early 2019 saw increased activity on site in preparation of Final Investment Decision (FID). Activities primarily focused on water course isolation, fish salvage, tree clearing, site preparation and associated environmental monitoring activities.

Activities in the reporting year April 1, 2018 – March 31, 2019 include:

- Kitimat River Side Channel (KRSC) fish fence installation, isolation and salvage
- Beaver Creek Phase 1 (BCP1) fish fence installation, isolation, salvage and realignment
- Complete the Moore Creek Dyke Breach offset project
- Water management throughout the Project site, including installation and management of erosion and sediment controls
- Wildlife management activities, including wildlife monitoring; den surveys prior to tree clearing activities; and wildlife observation tracking
- Implementation of best management practices for migratory birds including; avoidance, work scheduling, bird nest surveys prior to tree clearing activities, and established buffers
- Management of fish and fish habitat, including installation of fish exclusion fencing and associated fish and amphibian salvage
- Facilitation of 24 formal regulatory inspections and tours by various agencies, often in conjunction with Haisla Nation, including the Environmental Assessment Office (EAO), Oil and Gas Commission (OGC) and the Canadian Environmental Assessment Agency (CEAA)
- Baseline monitoring of adjacent wetland habitats, spawning surveys and fish habitat
- Osprey nest relocation on Terminal B
- Fisheries Act Authorization (FAA) 15-HPAC-00918 for the Workforce Accommodation Centre (“FAA1”) fish habitat effectiveness monitoring as per 2018 Fisheries and Oceans Canada (DFO) approved modifications.
- Slash burning from clearing activities
- Progressing Marbled Murrelet and Wetland Compensation Plan implementation

As per FAA 15-HPAC-00585 for the marine construction scope, the timing window for dredging activities is from September 1 – February 15 annually. In Q3 2018, construction on the LNG Canada

dredgeate disposal site (DDS) commenced in preparation for disposal of dredged material classified as below industrial land use (IL-) onshore. On September 1, 2018, LNG Canada's first marine construction season opened and dredging-related activities in the LNG Canada dredge pocket commenced, including

- Crab salvage
- In water works to remove obstacles and debris from the LNG Canada dredge pocket, including removal of existing wooden and creosote piles
- Dredging of IL- material and disposal in the DDS
- Dredging of Disposal at Sea (DAS) material and disposal at the permitted DAS site
- Associated activities related to personnel transport, barge transport, and management of vessel movements

No piling in the marine environment took place during the reporting year.

An extensive field environmental monitoring program was implemented for the marine activities as per the LNG Canada Marine Monitoring Plan (MMP), including:

- Effluent quality monitoring during handling of IL- material
- Water quality monitoring during dredge and disposal at sea activities, to track dredge plume behavior and monitor compliance at the required compliance distances
- Sediment quality monitoring and sedimentation monitoring at identified sensitive receptor and reference sites
- Crab tissue sampling in support of the biomonitoring program
- Marine mammal monitoring during in water works, including dredging and DAS

2.2. Implementation Schedule

LNG Canada has developed a Project Implementation Schedule that outlines commencement and completion dates for each condition in the Decision Statement. The Implementation Schedule is publicly available on the LNG Canada website (www.lngcanada.ca). All updates to the CEAA Implementation Schedule are provided to CEAA and Indigenous Groups as required by the Decision Statement.

The following LNG Canada Project Implementation Schedule submissions have been completed to date:

- September 15, 2015: first CEAA Implementation Schedule submission more than 30 days prior to construction activities commencing.
- December 2, 2016: updates to the marine activities schedule
- June 30, 2017: first biennial CEAA Implementation Schedule update as per the Decision Statement
- July 4, 2018: updated CEAA Implementation Schedule in preparation for marine construction commencement (September 2018)

2.3. Environmental Management Plans

The LNG Canada *Construction Environmental Management Plan* (CEMP) is the overarching framework that encompasses LNG Canada's terrestrial environmental management program and includes all mitigation measures, best management practices, monitoring and reporting requirements associated with each Environmental Management Plan (EMP) developed for the Project. LNG Canada's CEMP has been developed in consideration of community commitments and environmental best practices, and with input from regulators, Indigenous Groups and stakeholders.

The CEMP also includes EMPs to manage environmental aspects and impacts related to terrestrial and freshwater Project construction, including but not limited to topics such as air quality, light and noise management, vegetation and invasive plant management, surface water and wastewater management, wildlife, marine and fish habitat resources, management of archeological and heritage resources, waste management and erosion and sediment control.

The CEMP and EMPs are implemented using an adaptive management approach based on continual improvement principles.

No updates to the CEMP or supporting plans took place during the reporting year.

The Marine Activities Plan (MAP) is the overarching framework that encompasses LNG Canada's marine environmental management program, and includes general marine mitigation measures, best management practices, marine environmental monitoring and reporting requirements. LNG Canada's MAP has been developed in consideration of community commitments and environmental best practices, and with input from regulators, Indigenous Groups and stakeholders.

The MAP also includes supporting marine EMPs to manage environmental aspects and impacts related marine Project construction, including the Marine Access Traffic Management Plan (MATMP), Marine Monitoring Plan (MMP), and Dredge Environmental Management Plan (DEMP). The MAP and supporting marine EMPs are implemented using an adaptive management approach based on continual improvement principles.

To support implementation of EMP requirements in the field, contractors are required to prepare Environmental Work Plans (EWPs) for defined scopes of work, including scopes of work related to environmentally sensitive areas. EWPs describe specific work activities and the associated mitigations that need to be implemented to ensure the environment is protected, while completing the work activities. Each EWP includes, but is not limited to:

- Activity location, including site boundaries or external property considerations;
- Detailed description of scope of work addressed by the EWP, including schedule and duration of construction activities, as well as equipment utilization;
- Baseline environmental sensitivities adjacent to the defined activity location (e.g. fish habitat, riparian habitat, rare plants or plan communities, wildlife values, known or potential archaeological values, sensitive receptors, water quality sensitivities, areas of suspected contamination, etc.); and
- Permits, approvals and consents relevant to proposed work, and key terms and conditions and timing constraints.

EWPs are used to support continual improvement by defining monitoring and inspection requirements, outlined in detail in Section 2.3.1.

2.3.1. Monitoring

LNG Canada is frequently re-evaluating mitigation and monitoring measures during the construction phase to ensure that activities are in compliance with regulatory requirements and consistent with Project commitments. This adaptive management strategy is outlined in the compliance management system, including environmental management plans.

LNG Canada has retained the services of Haisla-Triton, a joint-venture between Haisla Nation and Triton Environmental, to provide Environmental Monitoring (EM) services for the Project, including the services of a Qualified Environmental Professional (QEP) to monitor construction activities. EMs have been given the authority to stop work in cases where mitigations are not sufficient and in cases of non-compliance. Environmental Monitoring activities are also undertaken by qualified LNG Canada environmental professionals and contractors. LNG Canada contractors are required to complete weekly regular worksite inspections and assess effectiveness of housekeeping, erosion and sediment controls, discharge water quality parameters and presence/absence of invasive plants, among other things, while work is being undertaken.

LNG Canada receives reports from the EMs and QEPs on site on a regular basis, as defined by management plans. Evaluation of mitigation and monitoring measures takes place a variety of ways, including but not limited to, self-audit and self-inspection by LNG Canada personnel and contractors,

inspections led by regulatory agencies, and opportunities for improvement arising from near miss and other incidents.

Corrective or preventative actions may be identified through any of the above processes, resulting in amendments to individual EMPs or EWPs and implementation of additional mitigations as required.

JFJV has implemented an EM program and has retained the services of Haisla-Triton for EM services on site. JFJV oversees the implementation of its EM Program and regularly shares information with LNG Canada.

2.3.2. Erosion and Sedimentation Control

Erosion and sediment controls (ESC) are installed to isolate all construction activities from adjacent freshwater fish habitat and protect surrounding vegetation. A variety of erosion control techniques are implemented as needed, including but not limited to silt fencing, straw wattles, riprap, geosynthetics, seeding, ditching and contouring.

The LNG Canada Sediment and Erosion Control EMP outlines the environmental management requirements related to ESC during early works, construction and pre-commissioning. Among other things, the Sediment and Erosion Control EMP:

- Identifies regulatory requirements, stakeholder and project commitments related to erosion and sediment control and protection of surface water;
- Identifies project activities and potential environmental effects associated with ESC; and
- Identifies mitigations required to prevent erosion and control sediment during construction activities.

The Sediment and Erosion Control EMP provides information on the best practise and standard methods for ESC.

LNG Canada minimizes tree clearing wherever feasible to control erosion. The Project has implemented a number of ESC controls during early works and construction, including sediment fencing, straw wattles, sediment booms, berms armoured with rip rap, sediment bags on discharge hoses, and geosynthetic blankets. LNG Canada has also utilized ditches with check dams and construction of settling ponds, where appropriate. Seeding of slopes and disturbed areas is undertaken as soon as practicable after construction, and contouring the ground to minimize surface water flow is undertaken as required. For example, during the reporting year, Skeena park mix was used as a means of sediment and erosion control to temporarily re-vegetate cleared areas at BCP1 and Moore Creek Dyke Breach areas.

To ensure effectiveness of the ESC mitigations, water quality is sampled frequently downstream of the construction activities to ensure that sediment is not impacting surface water bodies, fish or wildlife. If issues are detected downstream of the construction site, construction activities upstream are suspended or minimized until the situation is assessed and additional ESC mitigations measures are installed, as required. To ensure the ESC mitigations are effective and in working order, joint assurance walks are conducted with LNG Canada and contactors on site weekly at a minimum. In addition, EMs conduct and oversee the daily monitoring of the project site.

LNG Canada is committed to ensuring ESC best practise and standard methods will be implemented during all phases of the project.

2.3.3. Vegetation Management

The LNG Canada Vegetation Management Plan outlines mitigation measures pertaining to red and blue-listed plants and communities. Construction activities undertaken in the reporting year did not impact red and blue-listed plants and communities.

Vegetation removal through site clearing activities, such as tree felling, grubbing and stripping, occurred in areas associated with FAA 16-HPAC-00220 for the LNG Facility (FAA2). Clearing was limited to areas within the project footprint and no non-compliance events occurred in association with vegetation removal. Approximately 155 hectares of vegetation was removed with 36,000 m3 of merchantable timber removed from site.

Vegetation waste was disposed of through a combination of mulching, air curtain incinerator (ACI) and open burning. OGC Waste Discharge Authorization (AA-109643) was received on December 21, 2018, allowing burning of up to 30,000 cubic meters of wood waste from the certified project area for the life of the Project using ACI. During the reporting year, approximately 7000 m3 of vegetation was disposed of through burning.

Riparian re-vegetation effectiveness was monitored in habitat compensation locations associated with *Fisheries Act Authorization – LNG Canada Workforce Accommodation Centre (15-HPAC-00918)* (FAA1) in 2017 with the following points noted:

- Herbaceous vegetation within the areas planted in 2017 is well established.
- Transects surrounding Pond 4 and west side of Channel 3 have demonstrated good germination.
- Naturally-occurring Red Alder seedlings have formed a carpet and are outcompeting the planted grass in much of the area around Channel 1, 2A, 2B and Pond 1.
- Most of the live stakes have established themselves and demonstrated good leaf growth with the expectation that cover will increase over time.

- Some planted conifers were subject to snow press however the majority were noted to still be alive and growing.
- Most transects are on land and do not measure the aquatic vegetation; however, the planted aquatic species appear to be doing well.
- Infill planting was not required to be conducted in 2018.

Revegetation will occur at designated habitat compensation locations as a means to increase riparian function, no permanent revegetation was conducted in the reporting year.

2.4. Decommissioning

No decommissioning activities took place during the reporting year. LNG Canada will develop a Decommissioning Plan in consultation with Indigenous Groups that will be submitted to CEAA at least one year prior to the end of operation and at designated intervals during the decommissioning process. Contents of the Decommissioning Plan will include, but are not limited to the following:

- Project components that will be decommissioned, desired end-state objectives of the areas that will be decommissioned and description of activities to be undertaken;
- Potential adverse environmental impact from decommissioning activities or by components that continue in their state at the end of operation and how adverse environmental effects will be monitored and mitigated
- An approach to consulting Indigenous Groups and federal and provincial authorities throughout the decommissioning phase.

2.5. Transfer of Ownership

No transfer of ownership took place during the reporting year. On July 17, 2018, North Montney LNG Limited Partnership (MNLLP), took an equity position in LNG Canada. LNG Canada remains the Proponent, and sole holder of the CEAA Decision Statement, and no amendments are required to be made to the Decision Statement due to this change in participating interests.

LNG Canada will notify CEAA no later than 60 days after a transfer of ownership, care, control or management of the Designated Project as per *CEAA Decision Statement Condition 2.7* and *CEAA Decision Statement Condition 2.8*.

2.6. Records Management

Records related to the implementation of the Conditions outlined in the LNG Canada *CEAA Decision Statement* are maintained electronically as part of the LNG Canada CMS. Records are readily available, and include, but are not limited to the following:

- Records of mitigation and environmental program monitoring (e.g. surface water sampling results, site inspection results, waste disposal, etc.)
- Records of fish and amphibian salvage activities, processes and results;
- Records of all consultation and notification to regulatory agencies, Indigenous Groups and external stakeholders
- Incident reporting and investigation documentation.

3. Regional Participation and Cooperation

LNG Canada is committed to participating in regional initiatives related to a number of topics, including cumulative effects monitoring and management of marine activities, as opportunities become available.

During the reporting year, LNG Canada provided data, obtained during the LNG Canada Environmental Assessment process associated with the marine bird surveys with the Canadian Wildlife Service (CWS) to assist with emergency response planning for the north coast of British Columbia.

In addition to partnerships related to cumulative effects monitoring, LNG Canada will continue to seek opportunities to consult with regional groups on development of policies and mitigations as appropriate.

LNG Canada also participated in the “Gitga’at-Gitxaala-Transport Canada Waterway Management Forum” under the umbrella of the Oceans Protection Plan (OPP). The purpose of the Gitga’at-Gitxaala-Transport Canada Waterway Management Forum is to create a space in which representatives from Gitga’at, Gitxaala, and potentially other First Nations in the area of interest, federal agencies and other levels of government, industry and marine stakeholders can share information, explore issues and develop recommendations for:

- Minimizing vessel traffic impacts and conflicts with local Indigenous and public marine use and small vessel traffic activities (via enhanced marine traffic communications, etc.);
- Minimizing vessel traffic impacts and conflicts with marine mammals (via enhancing environmental monitoring and operational measures such as noise reduction, vessel speeds and routes); and
- Possible multi-party structures for PVM moving forward.

4. Communication and Consultation

LNG Canada undertakes a range of initiatives to ensure the community and Indigenous Groups receive up-to-date information about the Project, and have an opportunity to ask questions and provide feedback. These initiatives include advertising, web postings, Facebook and Twitter, open houses, the Community Feedback Process and in-person meetings.

4.1. Public Consultation

During the reporting year, LNG Canada and JFJV consulted with public audiences on a range of topics about the Project, including project plans and permits. Consultation with local municipalities and departments, agencies, interested residents, stakeholders and the Community Advisory Group (CAG) was undertaken.

Topics included in public consultation in the reporting year include, but are not limited to:

- Final Investment Decision (FID)
- OGC Amendment
- OGC Facility Permit Extension
- Social Investment Programs
- Disposal at Sea (DAS) Variance Permit
- Municipal Taxation Structure

In addition to in-person meetings and workshops, LNG Canada held the following community sessions with the objective to share information and collect feedback:

- February 26, 2018 – Open house in Kitimat focused on reaffirming the strength and nature of the LNG Canada Project and the benefits associated with the Project. Open house was a town hall style and provided opportunity for attendees to ask questions.
- April 28, 2018– Open house in Kitimat followed by a community event. Project staff were available throughout the day to ensure community members and event attendees could have questions or concerns answered.
- June 6, 2018 – Terrace and Kitimat Chamber of Commerce along with Small Business BC held a one-day session with local businesses. Sessions collected feedback from local businesses regarding local opportunities and provided an all-day educational component on sales strategies, Human Resources, Networking and “building your business”

- July 31 – Open house in Kitimat focused on ensuring the community understood LNG Canada is still a viable project, with a focus on project timelines, as well as introductions to the JFJV team as well as other
- September 20 – Open house in Terrace focused on ensuring the community understood LNG Canada is still a viable project, with a focus on project timelines as well as introductions to the JFJV team
- October 17 Community event in Kitimat focused on thanking the community for their support and making project staff available to answer community questions.

JFJV has worked with LNG Canada staff to successfully handover engagement activities to the JFJV External Affairs Team. JFJV developed and commenced implementation of an engagement plan that is aligned with LNG Canada's public consultation requirements. Early engagement activities included JFJV senior management introductions to key stakeholders to establish relationships while providing a project update, and outlining JFJV's approach to execute the LNG Canada Project. Public consultation topics in the reporting year include, but are not limited to:

- EPC Selection (of JFJV)
- EPC Introductions, presenting the updated project execution strategy
- Updated Project layout and design changes
- Site clearing activities, including timber management and open burning
- Employment, contracting and training processes and opportunities
- Community Impacts
- OGC Waste Discharge Authorization for Air Curtain Incinerators

4.2. Notification of Consultation

LNG Canada ensures that opportunities to learn about project updates and provide feedback, including about comment periods associated with permit and approval applications, are adequately communicated to the public, to maximize public participation and input.

During the reporting year, notification of consultation and public comment periods was generally provided through local newspaper advertisements, on the LNG Canada website and Facebook page, required Gazette advertisements, emails and face-to-face communications with key stakeholders, and through other forms of notification.

4.3. LNG Canada and JFJV Websites

JFJV officially rolled out the www.jfjvkitimat.com website in March 2019, and implemented the JFJV Kitimat Facebook page in April 2019.

In May 2019, LNG Canada launched a new website. The LNG Canada Website provides information on the Project and the LNG industry. It provides the opportunity for LNG Canada to communicate significant project events and milestones to the public, and to keep them informed on project progress and issues of relevance to the local community. LNG Canada has its Facebook feed on the website, which makes it easy for the public to follow LNG Canada on social media. The website includes information on LNG Canada's environmental programs, including but not limited to, the CEAA Implementation Plan, Wetland Compensation Plan, Fish Habitat Management Plan, and the Archeological and Heritage Resources Management Plan. The CEAA Annual Report and any supporting documentation is also accessible via the website.

4.4. InFocus Magazine

LNG Canada distributes our InFocus newsletter, via Canada Post to all residents in the Kitimat, Thornhill and Terrace communities. InFocus provides information about LNG Canada's activities, upcoming events and opportunities to provide feedback. InFocus is distributed two to three times each year. In addition to LNG Canada's InFocus newsletter, LNG Canada regularly places advertorial / advertisements in local newspapers to provide project updates, including site activities and permitting processes, and to advertise opportunities for feedback. Currently, LNG Canada also advertises on local First Nations radio to ensure there is an understanding of the Project.

4.5. Social Media

In early 2016, LNG Canada launched its official Facebook community page and more recently Twitter and LinkedIn social media accounts. The purpose of the LNG Canada Facebook page is to engage with communities and share information on LNG Canada operations, events, and to provide the public with project updates and notifications. Currently there are 24,000 Facebook followers and about 12,000 Twitter followers. The page is monitored during regular business hours Monday to Friday in the Pacific Standard Time Zone.

4.6. Community Advisory Group

In 2014, the LNG Canada Community Advisory Group (CAG) was established to ensure that community interests are represented and considered as the project progresses. The CAG is comprised of a diverse group of 12 community members, who share their local knowledge to assist LNG Canada to make informed decisions about the Project, and who in turn share information about the Project with others in the community. CAG members act as Project subject matter experts in the

community, and provide a conduit between LNG Canada and the community about the Project, including advising what LNG Canada can do to improve performance and community relations.

The CAG was disbanded in December 2018 as LNG Canada moves to implement the Social Management Roundtables as defined in the Community Level Infrastructure Services Management Plan (CLISMP).

4.7. Community Feedback Process

LNG Canada formally developed its Community Feedback Process to provide an open and transparent means for the community to raise questions and have them addressed in a timely and consistent manner.

LNG Canada has a designated Community Feedback Focal, who actively monitors, tracks and responds to all feedback and concerns from the community. The Community Feedback Process is staffed and monitored during regular business hours, and all incoming community engagements are acknowledged within 48 hours.

Community feedback and grievances can be provided through a variety of ways, including:

- Local (+1 250 639 3229) and toll free (+1 855 248 3631) telephone numbers
- Email address (feedback@lngcanada.ca)
- In person via any face-to-face setting with LNG Canada employees or contractors.

Implementation of the Community Feedback Process is ongoing and is communicated with stakeholders and Indigenous Groups via several forums, including advertisements in local newspapers, the LNG Canada website, in-person meetings and Facebook. Additionally, refrigerator magnets continue to be distributed throughout the community educating community members on how to contact LNG Canada.

The LNG Canada Community Feedback process transitioned to the JFJV Community Feedback process beginning in April 2019.

All complaints and concerns, and associated responses from LNG Canada, are documented within the CMS processes.

4.8. Indigenous Group Consultation

LNG Canada continues to engage in consultation with Indigenous Groups regarding Project activities that may potentially impact Indigenous Rights and interests. In addition, LNG Canada continues to undertake a range of initiatives to ensure that Indigenous Groups receive up-to-date information about the Project, and have an opportunity to ask questions and provide feedback. The Senior Relationship

Lead for each Indigenous Group provides continued single point of contact for all methods of communication (e.g. letter, email, phone, face to face, etc.).

LNG Canada continues to implement the BC EAO approved Aboriginal Consultation Plan (August 2013), which describes the processes and various methods used to engage and consult with Indigenous Groups throughout the environmental assessment, including ongoing engagement post Environmental Assessment Certificate (EAC). Underpinning the various consultation tools that are described in the Aboriginal Consultation Plan are the Senior Indigenous Consultation and Relationship Leads for each Indigenous Group, who provide continuity of communications and a focal contact for all consultation that is related to the Project.

LNG Canada introduced JFJV to the key First Nations and had the opportunity to receive and hear their views in consideration of construction activities. JFJV developed and commenced implementation of its plan for Indigenous Group consultation, in alignment with the LNG Canada commitments.

Methods of engagement used to-date include, but are not limited to, face-to-face meetings, e-mails, phone calls, letters, community meetings, site-visits, quarterly project update meetings, and other methods that may be preferred or requested by individual Indigenous Groups through the consultation process. Each of these engagement tools provides an opportunity for ongoing information sharing and feedback regarding the Project. Engagements related to specific conditions are described under those sections of the report.

Following the sharing of the draft LNG Canada Aboriginal Consultation Summary Report with Indigenous Groups on October 2017, and the feedback and comments that were received during the period of November to December 2017, LNG Canada submitted the Final Draft of the Aboriginal Consultation Summary Report to the EAO in December 2017. The Final Report was shared with all Indigenous Groups on January 31, 2018.

LNG Canada will continue to implement the EAO Approved LNG Canada Aboriginal Consultation Plan (dated August 2013) for all phases of the Project. The next Aboriginal Consultation Summary Report is due one year after the commencement of Operations.

In addition to formal Indigenous Group consultation as outlined in the Plan, LNG Canada also offers numerous opportunities for Indigenous Groups to participate in the implementation of field environmental monitoring programs by participating in monitoring activities at site. Throughout the reporting year, Haisla Nation participated in various monitoring activities at site, including fish and crab salvage, water quality sampling, and marine mammal observation.

LNG Canada will continue to identify and provide opportunities for Indigenous Group members to participate in various monitoring activities (outlined in the environmental management plans) occurring in their respective traditional territory.

4.9. Environmental Management Plan Consultation

In May 2015, LNG Canada began engagement with Indigenous Groups on the development of the CEMP and associated topic specific environmental management plans (EMPs), including:

- CEMP
- Air Quality Management Plan
- Noise Management Plan
- Traffic Management Plan
- Fish Management and Monitoring Plan
- Vegetation Management Plan
- Invasive Plant Management Plan
- Wetland Compensation Plan
- Surface Water Management Plan (Construction)
- Wildlife Management Plan

No consultation related to the CEMP or related plans occurred during the reporting year.

In October 2017, LNG Canada initiated consultation with Indigenous Groups and regulatory agencies on the development of the Phase I Marine EMPs (MAP and MATMP). The MAP and MATMP were approved by EAO on February 8, 2018 and provided to regulatory agencies and Indigenous Groups as required.

In February 2018, LNG Canada initiated consultation with regulatory agencies and Indigenous Groups on the Phase II marine EMPs, the MMP and the DEMP. The consultation included a series of in-person engagements through February and March of 2018 to discuss the content of the Phase II marine plans. Indigenous Groups and regulatory agencies provided written comments on the MMP and DEMP throughout March and April of 2018. These comments were considered and incorporated into the final LNG Canada MMP and DEMP, which were submitted to the EAO for Approval on May 31, 2018. The MMP and DEMP were approved by EAO on June 21, 2018. Copies of the MMP and DEMP, along with the associated consultation comment trackers, were provided to regulatory

agencies and Indigenous Groups as required. A summary of changes resulting from consultation was also provided to facilitate review.

LNG Canada continues to engage with regulatory agencies and Indigenous Groups and provide updates on the development and implementation of management plans, through information sharing and formal reporting processes. The CEMP, MAP and supporting EMPs will be continually reviewed and revised as appropriate as part of LNG Canada and JFJV's approach to adaptive management.

5. Emergency Preparedness and Response

Unplanned events could arise from accidents or malfunctions associated with Project activities, resulting in impacts to environmental, social, health, heritage or economic values.

During consultation on the Phase II marine EMPs, LNG Canada also developed the LNG Canada Strategy for Communicating Accidents or Malfunctions (Construction) (C000-000-HX-6180-0005) in support of CEAA Decision Statement Condition 10.3. This document describes the types of accidents or malfunctions scenarios that require notification and the manner by which LNG Canada would notify Indigenous Groups in the event of an accident or malfunction, as well as details of the points of contact for LNG Canada and the respective Indigenous Groups.

LNG Canada has identified scenarios for potential accidents or malfunctions in the CEAA Application ("Application"). The Application considered the likelihood and consequence of the occurrence, and considered scenarios for each of the potential accidents or malfunctions, according to the likelihood of the scenario arising and the potential consequence or severity of the scenario arising. Credible scenarios analyzed in the Application are summarized in Table 5-1: Accidents and Malfunctions.

Table 5-1: Accidents and Malfunctions

Accident of Malfunction Scenario	Applicability to Reporting Year
Spills of hazardous materials (not including LNG)	Applicable to construction and reporting year
Loss of containment of LNG at the LNG processing and storage site	Not applicable to construction
Emergency LNG facility shutdown	Not applicable to construction
Explosion and Fire	Applicable to construction and reporting year
Marine vessel grounding and collisions, including collisions with marine mammals and loss of cargo	Not applicable to reporting year

Of the above analyzed scenarios, a potential spilling of hazardous materials (not including LNG), as well as fire or explosion, applies during the current project construction scope. Incidents relating to

loss of containment of LNG, LNG vessel incidents, and emergency facility shutdown cannot credibly occur during construction activities and are applicable to the operations phase of the Project.

No accidents or malfunctions took place during the reporting year.

5.1. Emergency Response and Notification

LNG Canada emergency procedures are in place to ensure timely and effective decision making in the critical period during and following an emergency. The LNG Canada Emergency response framework contains a series of inter-related documents and manuals that outline the tools (plans, procedures and processes) and reference materials required to facilitate a prompt, safe, efficient and effectively managed response to all incidents resulting from LNG Canada construction regardless of size or complexity.

These incident management procedures are detailed in the Project's Emergency Response Plans (ERPs). LNG Canada subscribes to the principles and processes outlined in the Incident Command System (ICS) structure.

The Core ERP is the foundation document of the LNG Canada emergency response process. The Core ERP sets the standards for emergency response and includes, but is not limited to, details for communication and planning of emergency response activities; description of ICS; roles, responsibilities; requirements and frequency of training and exercises; initial response actions and notification requirements; and general hazard and response procedures.

A site-specific ERP for construction activities has been developed that contains detailed information related to emergency response resources, notification requirements and modes of emergency communication. It contains plans for the most probable emergency scenarios including detailed information to support incident response, information on emergency response resources, notification requirements and modes of emergency communication. In alignment with this plan, JFJV has developed additional emergency preparedness and response plans, that provide more detailed plans and procedures for on-site emergency response actions, notifications and recovery.

LNG Canada staff and contractors are trained to immediately respond to all spills by controlling and containing the release. Adequate spill response equipment is available on site to respond to *Most Likely* spill scenarios, and contractors are required to have adequate spill capabilities related to their scope of work and risk. LNG Canada ensures that spill supplies are available in proximity to work being done.

LNG Canada staff and contractors are required to report all incidents, including spills, to their supervisor as soon as reasonably practicable. Incident notification is escalated through the LNG Canada organization, and external stakeholder and regulatory notifications are completed.

All spill and incident reporting is conducted according to requirements under the Emergency Management Act (EMA), the Oil and Gas Activities Act (OGAA) and CEAA. If an incident is deemed an *Accident or Malfunction* (as per Section 5.0), LNG Canada will notify relevant federal and provincial authorities, and Indigenous Groups, as soon as possible.

All regulatory reportable spills and environmental incidents are documented. High-risk incidents will be investigated to determine root and contributing causes and identify corrective actions to prevent recurrence.

5.2. Communication Strategy

In early 2018, LNG Canada developed the *LNG Canada Strategy for Communicating Accidents or Malfunctions (Construction)*, in consultation with Indigenous Groups, as required by CEAA Decision Statement Condition 10.3. The Strategy outlines the process for notifying Indigenous Groups, as well as contact information for reporting. Reportable scenarios and criteria are outlined in the Strategy for spills, explosion, fire and vessel collisions.

For spills of hazardous materials (not including LNG), CEAA and Indigenous Groups will be jointly notified of any spills that:

1. Are not contained within the Project footprint; or

2. Have potential to migrate off site (e.g. releases to waterbodies); or

3. Are not readily cleaned up or contained (i.e. incidents that trigger a larger response such as Incident Command System mobilization).

Any fire and explosion scenarios for the construction phase will, in all likelihood, be related to fuel storage on vessels and barges. For fires and explosions related to marine construction as outlined in the *LNG Canada Strategy for Communicating Accidents or Malfunctions*, CEAA will be notified and the affected Indigenous Group, based on location of the incident and traditional territory considerations, will be notified.

Collisions between vessels, or collisions between a vessel and a stationary object, within the Port of Kitimat that result in environmental damage will be jointly reported to CEAA and Haisla Nation.

6. Fish and Fish Habitat

The landscape surrounding the Project contains a range of terrestrial, aquatic and wetland habitats that support populations of wildlife and fish. These ecosystems are important not only to the health of the natural landscape, but also to residents who rely on the environment for recreation and traditional use.

Several plans have been developed in consultation with regulatory agencies and potentially affected Indigenous Groups to mitigate any impacts to fish and fish habitat.

The LNG Canada *Surface Water Quality Management Plan* outlines mitigation measures pertaining to water quality and aquatic habitat that are implemented during construction. At a minimum, LNG Canada will:

- Minimize disturbed areas and stripping of vegetation and soils, where practicable, and maintain as much of the natural vegetation cover as possible
- Install erosion controls to prevent erosion and install detention ponds and other runoff management controls to prevent sediment migration to surface water bodies
- Ensure all discharges from the construction site meet regulatory requirements, including the *Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life* and the *BC Approved Water Quality Guidelines*
- Ensure all construction equipment is mechanically sound to avoid leaks of oil, gasoline, hydraulic fluids, grease and other substances
- Ensure all diversions of water from excavations are controlled, and that they do not enter watercourses unless testing is completed, and all surface water criteria are met

Associated EMPs exist to support the *Surface Water Quality Management Plan*, including but not limited to the *Sediment and Erosion Control Plan* (refer to Section 2.3.2 for more information) and the *Fish Habitat Management Plan* (refer to Section 6.2 for more information).

Mitigation of impacts to fish and fish habitat are routinely considered during the design of the LNG Canada Project. The main water intake facility will be protected to prevent fish from entering the intake. The location of the water intake will also reuse existing infrastructure to minimize construction in the river to the extent practicable.

6.1. Marine Works

As per FAA 15-HPAC-00585 for the marine construction scope, the timing window for dredging during the reporting year was from September 1 – February 15. In Q3 2018, construction on the LNG Canada

dredgeate disposal site (DDS) commenced in preparation for disposal of dredged material, classified as below industrial land use (IL-), onshore. On September 1, 2018, LNG Canada's first marine construction season opened and dredging related activities in the LNG Canada dredge pocket commenced, including.

- Crab salvage
- In water works to remove obstacles and debris from the LNG Canada dredge pocket, including removal of existing dolphins and creosote piles
- Dredging of IL- material and disposal in the DDS
- Dredging of Disposal at Sea (DAS) material and disposal at the permitted DAS site
- Associated activities related to personnel transport, barge transport, and management of vessel movements

An extensive field environmental monitoring program for protection of fish and fish habitat was implemented for the marine activities related to dredging as per the LNG Canada Marine Monitoring Plan (MMP), including monitoring of marine mammals, which is outlined in Section 6.1.3.

6.1.1. In Water Construction

Marine EMPs have been developed in consultation with Indigenous Groups and regulatory agencies as outlined in Section 4.9 and 6.1.

The Marine EMPs address environmental mitigations and monitoring requirements for marine in-water construction, including but not limited to mitigations related to water quality, sediment quality, underwater acoustics, marine mammal observation and management, and management of dredgeate for disposal onshore and at sea.

Prior to the start of in-water construction activities, LNG Canada established the location and timing of sensitive life stages and habitat occupancy for fish, including marine mammals, in consultation with DFO and Indigenous Groups through the Fisheries Act Authorization permitting processes. As per FAA 15-HPAC-00585 for the marine construction scope, the timing window of least risk for dredging activities during the reporting year was from September 1 – February 15. All marine activities in the reporting year took place within this identified timing window.

During marine in-water construction, a robust field environmental monitoring program was implemented to ensure compliance with water quality guidelines and to prevent incidents related to marine mammals. The monitoring programs implemented during the reporting year are outlined in the approved MMP, and are summarized below.

6.1.2. Water Quality

Water quality is monitored during dredge related activities to ensure compliance with BC Water Quality Guidelines as outlined in the MMP.

Numerical modelling indicates that at a distance of 300 m from the edge of the dredging pocket, Total Suspended Solids (TSS) will meet marine water quality guidelines (i.e. a change from background of 15 mg/L TSS at any one time for a duration of 24 hours in all waters during clear flows or in clear waters). Therefore, 300 m is the initial compliance point for TSS during dredging activity. Similarly, numerical modelling indicates that at a distance of 500 m from the edge of the DAS site, TSS will meet marine water quality guidelines. The compliance line for DAS activities is therefore 500 m.

A tiered monitoring approach was implemented during dredging to evaluate potential impacts to water quality, and subsequent disposal of the dredged material at sea. Tier 1 monitoring characterized plume behavior in both space and time at both the dredging and disposal at sea locations using acoustic (i.e. sound-based) tracking technology. Plume tracking measures the movement of the suspended sediment plumes, in terms of both where they go and how long it takes for them to dissipate to background levels. Water samples taken from within the plume as it moves away from its source are used to measure concentrations of any contaminants associated with the suspended sediment and to characterize how these concentrations change with time or distance. Once plume movement has been adequately characterized, the results are used to determine the location of Tier 2 monitoring buoys. These buoys are equipped with a suite of sensors to provide continuous (e.g., hourly or less) automated measurements of turbidity and other parameters at a distance of 300 m from the edge of the dredging pocket.

There were no exceedances of water quality guidelines at the compliance line during dredging or disposal at sea during dredge activities within the reporting year.

LNG Canada experienced some challenges with the volume of reports required to be generated under the approved MMP, with upwards of 50 reports being compiled per month by Contractors, including water quality monitoring. Lessons learned during the first dredge season related to reporting volumes will be incorporated into proposed changes for the 2019 MMP review and updates as appropriate.

6.1.3. Marine Mammals

The LNG Canada MMP defines the monitoring and mitigation measures related to marine mammal protection during dredging and disposal at sea activities. The MMP establishes a monitoring program, overseen by a QEP, that includes the deployment of qualified Marine Mammal Observers (MMO) at strategic locations at the Project site.

Experienced QEPs, with support of local personnel as required, are employed as full-time MMOs to monitor during in water activities, both during the day and at night. Qualified MMOs have the ability to identify marine mammal species possibly encountered in the Project area, accurately describe relevant behaviour of marine mammals and accurately estimate the location of the individual in relation to any marine mammal exclusion zone (MMEZ) boundaries.

The MMP defines the required MMEZ for activities where underwater noise levels are anticipated to exceed 160 dB at a reference pressure of one micropascal. These activities are specific to piling and ground improvement for the LNG Canada project.

The number and location of MMOs, as well as the applied mitigative measures to be taken, is dependent on the activity being undertaken (i.e. pile driving, Material Offloading Facility (MOF) construction, dredging, etc.). All MMO stations will work together and be in communication to ensure waters are visible as required.

During dredging, land-based MMOs were positioned to ensure that dredging activities were visible and identified exclusion zones were visible. Land based MMO stations during the reporting year included locations at the Methanex Jetty and at Hospital Beach. Vessel-based MMOs were present on dredge and disposal related vessels during dredging and transport to the permitted disposal at sea location.

MMEZ boundaries for dredging during the reporting year were defined as 150 m for pinnipeds and 300 m for cetaceans.

If a marine mammal is observed within the dredging MMEZ, the MMO assessed the behaviour, location, and direction of travel of the animal if it was moving towards dredge activity. If a marine mammal is observed immediately adjacent to the activity, such that there is risk of physical harm from direct contact, work was stopped. Work only resumed once the animal left the immediate area or was not been re-sighted for 30 minutes.

During the monitoring, MMOs were monitoring the LNG Canada Project as defined in the MMP, as well as in water works adjacent to the Project site. Marine mammal observing was conducted with the naked eye, with the assistance of reticle binoculars during daytime observations, and with Forward-Looking Infrared (Radar) (FLIR) technology for night time observations. Reticle binoculars were used to obtain estimates of distance in reticles from the observer to the observed marine mammal(s).

During the first dredge season, observations of marine mammals in and around the LNG Canada Project included:

- Eleven observations of one or more marine mammals in the MMEZs

- Mitigation measures included nine shutdowns and two delayed starts
- Observations consisted of two humpback whales, four stellar sea lions, one killer whale, two river otters, and one harbor seal (observations included one or more individuals)

In water activities, including dredging, disposal or vessel movement activities, were stopped a total of nine times during the first dredge season. Some of these shut downs were due to observations of marine mammals within the LNG Canada MMEZ, and some were related to poor visibility or other operational factors. No marine mammal incidents occurred within the reporting year.

During the first dredge season, LNG Canada and its contractors tested multiple methods of detection for marine mammals including night vision to refine the MMO program. A training program was developed and implemented to standardize and confirm MMO qualifications for the program. LNG Canada also implemented a requirement for 30-minute pre-activity monitoring for marine mammals prior to execution of work. Lessons learned during the first dredge season related to the MMP program will be incorporated into proposed changes for the 2019 MMP review and updates as appropriate.

No piling or ground improvement activities took place during the reporting year.

6.2. Fish and Amphibian Habitat

During construction activities, LNG Canada is committed to avoiding and mitigating impacts to fish and fish habitat. The LNG Canada *Fish Habitat Management Plan* and Fisheries Act Authorizations outline requirements to protect freshwater fish habitat at the Project site during construction.

Fisheries Act Authorization 15-HPAC-00918 for the Workforce Accommodation Centre (“FAA1”) provides LNG Canada with authorization to construct CVL, which includes infilling of Beaver Creek wetland and off-channel watercourse habitats and clearing of riparian vegetation in and around said habitats. Specifically, the authorization allows for destruction of 27,082 m^2 of Beaver Creek wetland and off channel aquatic habitat and associated riparian vegetation from grubbing, clearing, excavation and infilling.

In August 2018, minor modifications to one of the offsetting channels occurred. The intent of the modifications were to produce deeper pools at strategic locations within the channel to allow fish to hold during summer low flow periods. The success of this modification will be monitored and assessed during the effectiveness monitoring program for FAA1.

Fisheries Act Authorization 16-HPAC-00220 for the LNG Facility (“FAA2”) provides LNG Canada with authorization to construct the LNG Canada production facility, which includes the diversion of Beaver Creek, Anderson Creek and KRSC. Specifically, the authorization allows for:

- Clearing, grubbing, infilling and excavation of 216,580 m^2 fish habitat within and adjacent to Anderson Creek, Beaver Creek, Moore Creek, Kitimat River estuary and the KRSC; and
- Dewatering of 2,403 m^2 channel (K3) connecting the KRSC to the Kitimat River.

Within the reporting period, serious harm associated with FAA2 occurred in KRSC, Beaver Creek and Anderson Creek. The KRSC channel was isolated of flow from the Kitimat River at the upstream and downstream ends in preparation of clearing, grubbing, infilling and offset construction. Beaver Creek temporary diversion was constructed and commissioned to move flows around the future LNG storage tank area. Previous channel was cleared and site preparations made for future construction. Flood protection berms were constructed along Anderson Creek to isolate several side channels.

Fisheries Act Authorization 16-HPAC-01079 for Supporting Infrastructure ("FAA3") provides LNG Canada with authorization to construct supporting infrastructure for the LNG Facility such as the loading line. FAA3 includes the diversion of off channel habitat of Moore Creek and destruction of off channel habitat. Specifically, the authorization allows for

- Destruction of 4357 m^2 instream fish habitat in tributary to Moore Creek; and
- Destruction of 1324 m^2 of wetland and off-channel habitat in a tributary to Beaver Creek.

No construction work has taken place under FAA3 during the reporting year.

Fisheries Act Authorization 15-HPAC-00585 for Marine ("FAA Marine") provides LNG Canada with authorization to construct LNG carrier berths, early offloading facility (EOF) and MOF which will include the infilling of intertidal and subtidal habitat, dredging of intertidal and subtidal habitats, clearing of riparian vegetation and installation of sheet and pipe piles. Specifically, the authorization allows for:

- Destruction of intertidal habitats including 67,455 m2 of salt marsh, 250 m2 of eelgrass and 26, 615 m2 of mudflat
- Permanent alteration of intertidal habitats including 46,279 m2 of mudflat and 12,864 m2 of vegetated rocky intertidal

Mitigation measures outlined in the FAA and related application were adhered to during the dredge season, including the application of the September 1 – February 15 extended dredge window. A qualified environmental monitor was present during all in-water construction activities and dredging.

Prior to the start of dredging, a crab salvage program was implemented in the Eurocan Basin. Crabs were salvaged and released to a suitable habitat away from marine construction activities. Fish salvage activities were undertaken in the salt marsh habitat in the Eurocan basin during the construction of the DDS.

Habitat offsetting activity under the marine FAA was limited to construction of access, trails and laydown areas for Minette Bay. No further construction of habitat offsets took place under the Marine FAA during reporting year.

6.2.1. Fish Salvage and Relocation

During the reporting year, fish salvage and relocation occurred during the isolation of KRSC, diversion of Beaver Creek Phase 1, site preparation activities and isolation of the intertidal zone for the LNG Canada DDS. During the reporting period an approximate total of 147,520 fish were salvaged from the salvage areas. Fish species varied depending on the habitat types salvaged, and included salmonids, Stickleback and Lamprey. All salvaged fish were released into habitat of a similar type and quality, with consideration of future construction and salvage efforts to minimize double handling of fish species.

To reduce impacts to crab during dredging, an effort was made to salvage crab species from the dredge pocket prior to commencing work. All salvaged crab were released to areas not impacted by marine construction. A total of 809 crabs were salvaged and relocated prior to dredging.

6.2.2. Amphibian Salvage and Relocation

During the reporting year, amphibian salvage and relocation occurred during the isolation of KRSC, diversion of Beaver Creek Phase 1 and site preparation activities. Approximately 7445 amphibians were salvaged, consisting of Western Toad and Northwestern Salamander. All salvaged amphibians were released into habitat of a similar type and quality, with consideration of future construction and salvage efforts to minimize double handling of species.

6.2.3. Fish Inventory Sampling

LNG Canada continued to collect baseline fish population and water quality data from habitats associated with FAA2 and FAA3. Fish inventory assessments and spawning surveys took place at various locations at the LNG Canada Project site during the reporting year. The inventory assessments were conducted by QEPs and provided additional baseline fish population and utilization information for the Project site to assist the project in understanding the success of the offsetting projects associated with the fisheries authorizations.

6.3. Habitat Offsetting Plans

LNG Canada is committed to offsetting Project related impacts to fish and fish habitat that contribute to the sustainability and ongoing productivity of Commercial, Recreational or Aboriginal Fishery (CRA)

fisheries by sustaining the productive capacity of freshwater and estuarine habitats in the Kitimat River watershed and estuary.

In consultation with DFO, BC Forests, Lands and Natural Resource Operations (FLNRO), and affected Indigenous Groups, a Habitat Offsetting Plan has been developed and implemented where applicable, for the CVL area, LNG Canada Facility, Supporting Infrastructure and the marine environment, as outlined in the associated FAAs.

Key considerations when developing the Habitat Offsetting Plans included the habitat restoration priorities identified by Haisla Nation and other stakeholders via the Lower Kitimat Watershed Planning initiative, as well as fisheries management objectives identified in DFO's Integrated Fisheries Management Plans.

LNG Canada has applied the following priorities in developing the Habitat Offsetting Plans:

1. In-kind habitat in the immediate vicinity of affected habitats, benefiting the affected fish species and life stages
2. Out-of-kind habitat in the immediate vicinity of affected habitats, benefiting the affected fish species and life stages
3. In-kind habitat in the same region as affected habitats (i.e. Kitimat River system, Kitimat Arm), benefiting the affected fish species and life stages

6.3.1. Consultation on Fisheries Offsetting Plans

To facilitate the design and implementation of effective and supported offsets for the broader LNG Canada Export Terminal, LNG Canada has been consulting extensively with Haisla Nation regarding the habitat offsetting plans since 2013. Consultation with Haisla Nation has been (and continues to be) conducted through in-person meetings, workshops, conference calls, official memos and letters and email. Members of Haisla Nation have also participated in the field work to collect fish and fish habitat data on the site of the LNG Canada Export Terminal and at offsetting sites within their traditional territory.

LNG Canada's engagement with Haisla Nation has included discussions about potential effects to fish and fish habitat, avoidance and mitigation measures, as well as input on fish habitat offsetting measures. These discussions began in September 2013 on conceptual fish habitat offsetting measures and have continued through development of current designs and submission of LNG Canada's Fisheries Act Authorization.

Feedback from Haisla Nation was incorporated into the offsetting strategy for the LNG facility, including the development and refinement of offset designs.

LNG Canada has engaged in extensive consultation with Haisla Nation throughout 2018 to discuss the Marine FAA and FAA2 related matters, including construction updates, implementation of fish management and monitoring plans, and associated provincial permit applications. Specific topics of engagements include:

- Separation of FAA2 related OGC Water Sustainability Act (WSA) Section 11 Permits related to changes in and about a stream into 3 separate Applications; Kitimat River Side Channel, Beaver Creek Phase 1 and Moore Creek Dyke Breach.
- Section 11 WSA workplan for stockpile development.
- Section 11 overview document that outlined all planned Section 11 applications, their timelines and how/where they relate to FAA2, as applicable
- Tripartite meeting with OGC to discuss Section 11 process and OGC Facility Amendment Permit Applications
- OGC Facility Amendment Package (9709124) for water alignment options
- Section 10 Temporary Water Use Plan
- Crown Land Use Application for Minette Bay Offsets
- Brush clearing at the KRSC in preparation for installation of isolation berm and site preparation.
- Sharing of dredging activities schedule which included all fisheries related work

LNG Canada engages in regular communication with Haisla Nation regarding all LNG Canada activities at site. Through these regular engagements, issues and concerns are raised and addressed in a transparent and collaborative matter.

6.3.2. Habitat Creation – FAA1

Construction of offset habitats for FAA1 began in summer 2016 and was completed in December of the same year. In 2017, it was determined that additional offsetting was required, resulting in the construction of Pond 4 and Channel 3 Extension.

The majority of the habitat created for FAA1 has, and will continue to be, in the effectiveness monitoring period. In the summer of 2018, modifications along Channel 1 were conducted to construct various deep pools to assist fish species in holding in the channel during low flow conditions. The pools averaged in depth between 1-2m with habitat complexing installed and are anticipated to be isolated during dry conditions.

In addition, it was noted during 2017 effectiveness monitoring that the Light Woody Debris (LWD) installed was not always effective. To help increase the utilization of this LWD, many of the pieces were cut or placed within the wetted width of the channel. Habitat effectiveness monitoring will continue to determine if this increases habitat utilization.

6.3.2.1. Habitat Effectiveness Monitoring

During discussions with DFO regarding the approval of FAA2 and FAA3, it was determined that a revised effectiveness monitoring plan and set of criteria for habitat acceptance was required, outlined in Table 6.3-1 Habitat Effectiveness Success Criteria. To ensure that all authorizations are consistent, the habitat effectiveness monitoring plan for FAA1 was also revised. Although habitat effectiveness data for the FAA1 offsets had been collected during 2017, the new plan incorporated significant changes and thus it was determined that 2018 would 'reset' the monitoring requirements outlined in FAA1. In effect, 2018 is now Year 1 of Habitat Effectiveness Monitoring for FAA 1, FAA2, and FAA3.

Table 6-3.1: Habitat Effectiveness Success Criteria

Measurable Parameter(s)	Metrics/Indicators
Density (summer)	Density (fish per m^2) with 95% confidence intervals will be compared based on habitat type (off-channel, wetland/pond) and location (offset versus reference or by watershed). As the monitoring program progresses, trend analysis will also be pursued. A successful result would indicate that densities in the offset habitats are statistically similar to (i.e., had overlapping confidence intervals with) the densities in reference habitats. Density results can also be compared to other regional data where available.
Relative abundance (summer)	CPUE (fish caught per 24 hours of minnow trapping) of fish species at sampling locations in offset and reference habitats will be correlated with density, if possible (allowing density estimates to be extrapolated to other locations in each offset habitat). CPUE results will also be compared between habitat types, offset or reference sites, and years, graphically and statistically, if possible.
Fish presence (winter)	Constructed overwintering habitats will be successful if used by salmonids during the late winter.
Length-frequency (summer)	The same age classes of juvenile coho salmon are represented at offset and reference sites in summer.

Habitat effectiveness monitoring has found that fish utilization of habitat offsets during summer continues to be low, primarily due to low shade value and increased water temperatures. Improvements in both shade and temperature from 2017 are evident and are anticipated to carry into 2019. Increased habitat utilization is seen during winter months when water temperature is not an issue and water depth and availability is good.

To assist the monitoring of water conditions within the habitat offsets, various real time monitoring equipment was installed in both pond and channel habitats. These monitor water temperature, dissolved oxygen, water elevation and flow rate.

6.3.3. Habitat Creation – FAA2

In late 2018, the first offsetting project associated with FAA2 was completed. A previously constructed dyke was removed from a tidally influenced channel connecting Moore Creek to Anderson Creek. The removal of the dyke allowed for stream connection between the two creeks to be reestablished. LNG Canada also installed various habitat complexing structures along the channel to improve fish habitat.

No other habitat offsets associated with FAA 2 or FAA 3 were constructed within the reporting period.

6.3.3.1. Effectiveness Monitoring

Effectiveness monitoring will commence in 2019 for the constructed FAA2 habitat offsets.

6.3.4. Habitat Creation – Marine FAA

No habitat offsets associated with the marine FAA were constructed within the reporting period.

6.3.4.1. Effectiveness Monitoring

No habitat offsets associated with the marine FAA were constructed within the reporting period.

7. Wetlands

LNG Canada is committed to mitigating adverse effects on wetland functions that support migratory birds, species at risk or the current use of lands and resources for traditional purposes by Indigenous Groups. In BC, wetlands designated as ecologically important to a region are defined by Environment Canada as the following:

- Provincially red – (threatened or endangered) and blue-listed (of special concern) wetland ecological communities
- Estuaries, as identified by the Pacific Estuary Conservation Program
- Areas of continental or regional significance to waterfowl within the Habitat Joint Venture planning boundaries of BC (e.g., estuaries in the Pacific Coast Joint Venture delivery area)
- All eelgrass (Zostera subspecies) beds

Approximately 49 hectares of ecologically important wetlands occur within the Project footprint. Five wetland classes (estuarine, fen, marsh, swamp and open shallow water) are represented, including red-listed and blue-listed wetlands (eelgrass beds are addressed within the DFO Marine FAA for intertidal habitats).

Compensation is considered the third element of the mitigation hierarchy, following avoidance and minimization of adverse effects. Complete avoidance of wetlands is the preferred alternative when wetlands are designated as ecologically or socio-economically important to a region. Due to the extent of wetlands in the Project footprint, feasible alternatives to completely avoid wetlands could not be identified.

7.1. Wetland Protection Mitigations

LNG Canada commits to mitigation measures to minimize and manage adverse effects on wetlands with the Project footprint and adjacent to it. These mitigations include, but are not limited to the following:

- Maintenance of hydrology during construction activities to the extent practicable
- Maintenance of wildlife passage during construction activities by limiting fencing, phasing construction activities and maintaining riparian vegetation where practicable
- Installation of collector ditches to divert surface water from the construction area to sedimentation ponds prior to release

- Design to maintain tidal flow-through the LNG loading line using raised infrastructure and breaks, which also allow stream and surface flow to continue
- Delineation of clearing boundaries prior to site preparation to keep clearing activities within the designated Project footprint
- Reclamation of temporary workspace as soon as practicable
- Implementation of the LNG Canada *Sediment and Erosion Control Plan* to manage surface water and avoid sedimentation to adjacent vegetated areas or wetlands
- Implementation of the LNG Canada *Invasive Plant Management Plan* to ensure eradication of invasive plants
- Implementation of the LNG Canada *Surface Water Management Plan* to address stormwater collection, treatment and disposal during construction
- Development and implementation of the LNG Canada *Wetland Compensation Plan* to address loss of wetland habitat function

Construction activities undertaken in the reporting year adhered to the applicable mitigations listed above.

Prior to undertaking any clearing activities, clearing boundaries are delineated based on Issued for Construction (IFC) drawings. All boundaries are flagged, and verification of clearing boundaries is completed by walking the perimeter of the flagged area prior to commencement of work. During clearing activities, construction crews are actively monitoring to ensure that delineated boundaries are adhered to and that any vegetated buffer zones are maintained.

All areas disturbed to create temporary workspace are reclaimed as soon as practicable. Erosion and sediment controls are installed prior to construction activities that could result in migration of sediment to adjacent vegetation or surface water bodies. Detailed information on mitigations related to erosion and sediment control is available in Section 2.3.2 of this report.

Within the reporting period, LNG Canada completed an assessment of wetlands adjacent to the Project construction footprint to establish a baseline of wetland function. Monitoring of wetlands adjacent to the construction footprint will continue annually until deemed no longer required.

7.2. Wetland Compensation Plan

LNG Canada has developed and continues to progress the LNG Canada Wetland Compensation Plan in consultation with EAO, Environment and Climate Change Canada (ECCC), Indigenous Groups, and FLNRO.

The Wetland Compensation Plan defines the actions LNG Canada will take to provide compensatory wetlands at a minimum 2:1 ratio. The objective of this plan is to implement wetland compensation measures as close to Kitimat as possible with wetlands that reflect a similar wetland type and functions to those that are lost. If reasonable and practical options for restoration, enhancement and/or creation of wetlands are not available locally within the Kitimat Valley area, then localized land conservation opportunities will be planned.

Of the 49 ha of ecological important wetland, approximately 40.1 hectares will need to be compensated for due to loss of function; with 31.7 ha of that compensated at a 2:1 ratio. The Wetland Compensation Plan includes the following components:

- Implementation of marine fish habitat offsetting as outlined in the Marine FAA that will establish 28.7 ha of estuarine wetlands within the Kitimat River Estuary with similar habitat function to the estuarine marsh habitat function in the Project footprint
- Approximately 18.2 ha of freshwater wetland creation or enhancement through pond construction, increased duration and extent of flooding
- Approximately 26 ha of compensation achieved via conservation allowance

A wetland monitoring program will be developed as required and access to wetland compensation sites will be made for Indigenous Groups for the purposes of gathering traditional use plants, wherever possible.

During the reporting year, specific locations for wetland compensation continued to be assessed. In late 2018, it was determined that one of the proposed wetland conservation candidate sites was already protected within an approved Wildlife Habitat Area (Grizzly Bear Habitat), and therefore should no longer be considered in LNG Canada's revised Wetland Compensation Plan. LNG Canada is now determining next steps, in consultation with Haisla Nation. When the final locations have been confirmed, LNG Canada will define how access will be provided to Indigenous Groups.

7.2.1. Implementation and monitoring

The Wetland Compensation Plan will be implemented iteratively per the surveyed areas of wetlands identified for compensation within five years of the start of construction (November 15, 2020). Monitoring will be conducted prior to and during construction to detect potential unanticipated loss of wetland functions on site and adjacent to the project footprint. Where any unanticipated loss of function occurs, additional mitigation measures will be developed and applied. Where unanticipated residual losses occur in ecologically important wetlands, these areas will be compensated for in a

similar manner as the compensation for the lost wetland functions outlined in the Wetland Compensation Plan.

LNG Canada will develop a monitoring program to ensure that wetland compensation measures are fulfilling the functions of the wetlands they are replacing. Details of the monitoring program are being developed, but will include the following:

- Compliance monitoring to ensure compensatory habitats are constructed or protected in accordance with the Wetland Compensation Plan
- Effectiveness monitoring to ensure that restored, enhanced and/or created wetlands are functioning as intended after construction and/or all protected wetland habitats and conservation buffers continue to function as predicted
- Adaptive management actions to promote long term performance of habitat

Monitoring will occur in year one, and in years three, five, and ten after compensation at the sites is completed.

8. Migratory Birds

LNG Canada is committed to implementing the Project in a manner that protects wildlife, including migratory birds and their habitat. Mitigations to support this commitment are outlined in the LNG Canada *Wildlife Management Plan* and the LNG Canada *Raptor Management Plan*. The *Environment Canada Avoidance Guidelines* to reduce the risk of incidental take of migratory birds, nests and eggs, was considered in the development of these plans and continues to be considered during execution of construction activities.

QEPs, including an Avian Biologist, are on site or available during construction activities to support LNG Canada and provide guidance on avoiding harm. Mitigations to avoid impact to migratory birds include, but are not limited to the following:

- Reduction of light and noise pollution where feasible
- Adherence to timing and restricted activity window requirements, including bird breeding periods and species at risk periods
- Adherence to provincial and federal setback distances for migratory bird and raptor nests

Annually between March 25th through August 17th, LNG Canada implements mitigations to reduce impact to migratory bird breeding and nesting habits. From January 1st through September 5th annually, mitigations to avoid impact to breeding and nesting raptors are implemented.

Under the guidance of a qualified QEP, the following mitigation hierarchy is implemented:

1. Where possible, tree clearing and ground disturbance activities take place outside of identified bird breeding periods
2. Where tree clearing and disturbance activities must take place within bird breeding periods, areas for clearance will be prioritized based on habitat risk evaluation
3. Bird surveys are conducted where timing restrictions cannot be met
4. If nesting is determined, required setbacks and mitigations will be implemented under the direction of a qualified avian biologist

A mitigation matrix (Figure 8-1) is followed to determine appropriate mitigation efforts that consider the disturbance level and nesting potential.

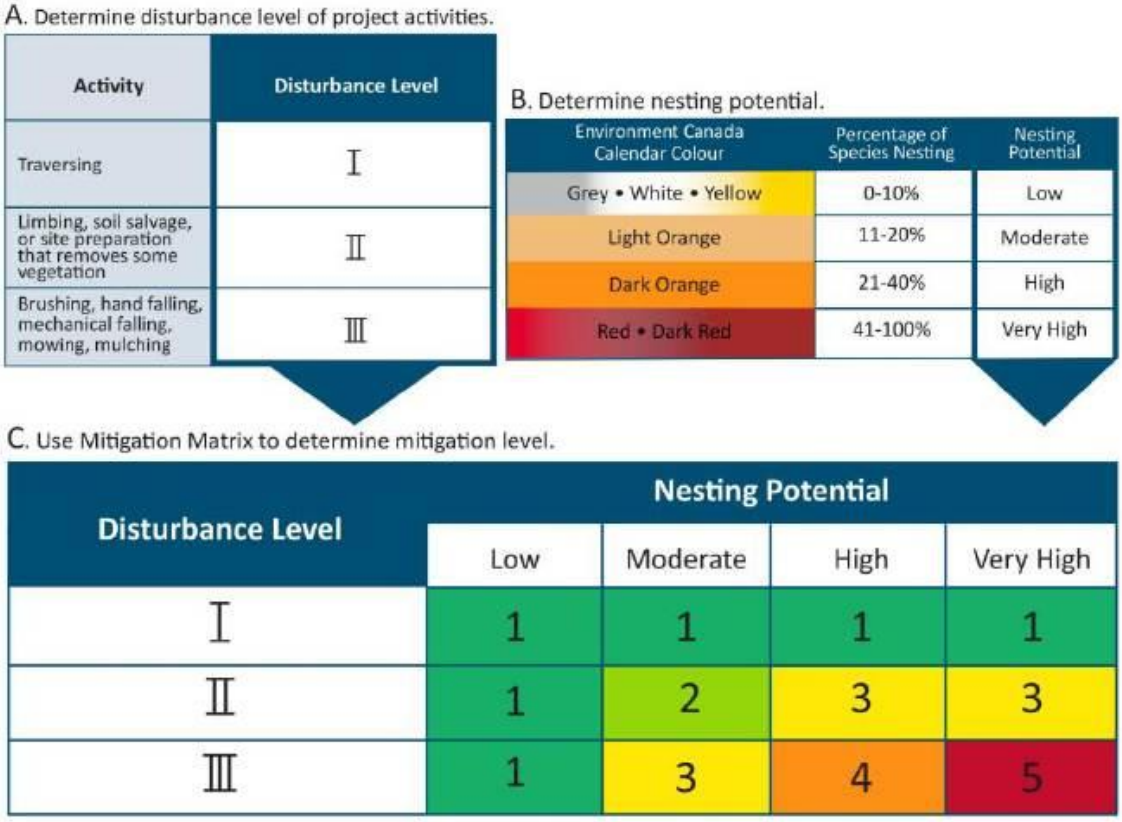

Figure 8-1: Migratory Birds Mitigation Matrix

During tree clearing efforts in the KRSC, and Plant site areas LNG Canada made efforts to clear as much land as possible outside of the breeding bird window in an effort to alleviate disturbance to migratory birds. Some associated vegetation removal was necessary to be conducted in the breeding bird nesting period. LNG Canada completed pre-disturbance bird surveys to ensure that no potentially active nests are present within the active construction area. Bird surveys are conducted by an Avian QEP based on site maps and survey information related to the active construction area. When an active nest is identified, barrier tape is installed to indicate a buffer area (“no-go” zone). The QEP determines appropriate buffer distances following accepted practice.

The QEP prepared a report on bird survey results daily for LNG Canada, which included a map of identified buffer zones. Construction progress and related active nests and buffer zones are tracked daily. Regular inspections are also undertaken to identify potential active nests on idle construction equipment. If active nests are found on equipment or infrastructure, buffer zones are identified as described above.

After tree clearing activities, the QEP conducts regular checks to assess whether mitigations are working. This includes inspection to ensure no broken eggs or destroyed nests are evident.

Active nests are monitored from a distance to confirm and track the status and ensure that construction activities in the vicinity do not impact nesting or fledging. The buffer can only be removed once the QEP has determined that the nest is no longer active and no other nests exist.

During the reporting year, 56 pre-disturbance bird nest surveys were completed for the LNG Canada Project, and 12 active nests were identified. No incidental take of migratory birds or their nests took place during the reporting year.

8.1. Osprey

During the reporting year, no nesting activity was reported to have occurred on the Project footprint.

An unutilized nest was located on the same light structure as the 2015/16 nest. With anticipated construction in 2019 of the wharf, LNG Canada applied for and received a permit (FLNRO SM18-405147) to remove the unoccupied nest. In January 2019, a new nest platform was constructed, and nest material was placed on the most southern edge of the wharf. LNG Canada has also committed to constructing a second nest platform in 2019 on the eastern side of the wharf outside future construction activities.

In the first quarter of 2019, it was observed that a bald eagle has started to utilize the nesting platform constructed in 2017 by LNG Canada.

8.2. Marbled Murrelet

Marbled murrelet surveys were completed for the LNG Canada Project site in 2014 and 2015. Surveys were completed in late May, early June, early July and late July to get an accurate picture of habitat use and associated marbled murrelet nesting activity.

If vegetation clearance is required during the nesting season in marbled murrelet habitat identified as being ‘potential marbled murrelet critical habitat’ or ‘high and moderate suitability marbled murrelet habitat’, a pre-disturbance nest survey will be undertaken as described in Section 8.0 of this report.

During the reporting year, LNG Canada removed potential high and moderate marbled murrelet habitat. Deforestation was conducted outside of the marbled murrelet breeding period.

LNG Canada continues to progress the marbled murrelet habitat compensation plan. Due to the nature of this habitat it is anticipated that the compensation will consist of habitat conservation. .

9. Human Health

LNG Canada is committed to reduction of noise and air emissions during Project activities, and takes steps to implement mitigations as appropriate.

LNG Canada applies Best Management Practices (BMPs) for construction noise from the *British Columbia Oil and Gas Commission's Noise Control Best Practices Guidelines*. BMPs are documented in the LNG Canada *Noise Management Plan*, which was developed in consultation with DFO, DOK and Haisla Nation. For activities taking place during the reporting year, the following mitigations were implemented:

- Traffic routing to avoid residential areas where possible;
- Adherence to municipal noise requirements and restrictions, including use of engine brakes;
- Proper management of construction vehicles and equipment, including consideration of maintenance requirements, noise mufflers and use of rubber tires where practical and available;
- Undertaking construction activities, including pile installation, between the hours of 0700 and 22:00, where practical;
- Implementation of a notification protocol to provide advance notice to residents of any planned substantial noise-causing activities at the LNG Canada site (refer to Section 4.0 of this report);
- Use of dust control measures on site including road watering, sweeping, speed control mitigations, and seeding of stockpiles; and

9.1. Noise Complaints

As outlined in Section 4.7 of this report, the LNG Canada Community Feedback Process was developed in consultation with Indigenous Groups and key stakeholders to track inquiries and complaints related to community concerns, including noise. The Community Feedback Process acknowledges all complaints within 48 hours.

No complaints were received by LNG Canada related to noise within the reporting year.

9.2. Marine Water and Sediment Quality

The LNG Canada marine EMPs define minimum requirements and mitigations for marine work, including management and monitoring of marine water and sediment quality.

The MMP includes an assessment of risks and potential duration of any exceedances of the CCME Water Quality and Interim Sediment Quality Guidelines, and BC Water Quality Guidelines and Working Sediment Quality Guidelines that could occur during dredging and other in-water construction activities. The marine EMPs identify mitigation measures to avoid such exceedances and reference notification protocols for any exceedances that do take place.

The marine EMPs identify mitigation measures to minimize sediment dispersion during in-water construction activities, such as project construction sequencing, consideration of metocean conditions and use of physical barriers as appropriate. Sediment and water quality monitoring were implemented in accordance with the MMP during in-water construction activities.

No water quality exceedances occurred during the reporting year.

A series of engagements around marine water quality management and DAS took place with Haisla Nation in the reporting year, including a site visit to the DAS site and engagements related to planned installation of marine monitoring equipment (buoys and sedimeters). Haisla Nation received weekly water quality reports as defined in the MMP throughout the first dredge season. The MMP also includes a program to confirm the human health risk assessment predictions from the baseline shellfish and groundfish tissue study that was conducted in 2015. During the reporting year, pre-dredge sampling took place in the LNG Canada dredge pocket for shellfish and groundfish tissue. Further sampling, as well as analysis and reporting, will take place in 2019.

10. Current Use of Lands and Resources for Traditional Purposes

LNG Canada is committed to protecting archaeological and heritage resources that could be impacted by the Project.

An Archaeological Impact Assessment (AIA) was conducted as per the BC *Heritage Conservation Act* (HCA) *Heritage Inspection Permit (HIP) 2013-0149* to identify potential areas of archaeological or cultural significance prior to construction activities commencing.

Fieldwork was conducted from June to November 2013 and in April and May 2014 by a team of professional archaeologists and Haisla First Nation representatives. Within the Project site, 23 areas were identified with moderate to high potential for buried archaeological sites. Subsurface testing was undertaken at all of these shovel test locations (STLs). A total of 510 STLs and seven evaluative units were excavated. One archaeological site was identified in the course of the AIA fieldwork for the Project (GaTe5).

Tree clearing took place in the vicinity of the known archaeological site; however, a suitable buffer was established to ensure encroachment did not occur. Snow fencing was utilized to delineate clearing boundaries and ensure entry into the site did not occur.

10.1. Archaeological and Heritage Resources Management Plan

LNG Canada has developed an *Archaeological and Heritage Resources Management Plan* in consultation with Indigenous Groups. The *Archaeological and Heritage Resources Management Plan* considers the BC Handbook for the Identification and Recording of Culturally Modified Trees and defines processes to follow to protect and preserve archaeological and heritage resources, and the procedure to follow in the event of a chance find of archaeological, cultural or heritage resources during construction.

The *Archaeological and Heritage Resources Management Plan* outlines the following hierarchy of mitigations for archaeological or heritage resources that require protection, preservation or recovery:

1. Avoidance through partial redesign or redirection of construction activities, including implementation of setbacks, etc.
2. Protection and preservation of the site on a temporary or ongoing basis (e.g. concealment, access limitations, etc.)
3. Salvage or emergency excavation as a mitigating measure to recover and repatriate any materials or human remains as defined in a Site Alteration Permit

The *Chance Find Procedure* provides a summary of the types of historical, archaeological, paleontological, or architectural resources potentially present in the project area that may be encountered during construction, including rock art (e.g. pictographs), Culturally Modified Trees and Tree Art (e.g. bark stripping), surface features from former habitations (e.g. burned rock, fish traps), and artefacts (e.g. stone, bone).

If a chance find is discovered on the LNG Canada site during construction, work is stopped, and the area is delineated with barriers to prevent access and protect the resource. LNG Canada will consult a professional archaeologist for guidance on further action. Further action may include confirmation that work can continue as planned, confirmation that work can continue under specific conditions, or confirmation that further assessment is required by a professional consulting archaeologist. All regulatory and Indigenous Groups will be notified as directed by the professional archaeologist.

No chance find events took place within the reporting year.

10.2. Marine Resources

To define procedures and practices for sharing information and facilitating communication with Indigenous Groups and other local marine users, a communication protocol was developed by LNG Canada and incorporated into the Marine Access Traffic Management Plan (MATMP). The communication protocol was developed in consultation with regulatory agencies and Indigenous Groups, and approved by EAO in February of 2018. The protocol includes processes for communicating the following:

- Location and timing of construction activities in the marine environment and location and timing of traditional activities by Indigenous groups
- Safety procedures related to marine construction and operation, including navigation aids and updated navigational charts
- Locations of restricted navigation due to safety reasons
- Operational speed requirements
- Methods of providing feedback to LNG Canada on adverse effects related to navigation

During the reporting year, vessel activity in the Kitimat Harbour was communicated to Indigenous Groups as outlined in the MATMP, including vessel schedules and construction activity.

- LNG Canada will also ensure that predictions made related to marine wake are accurate by developing a monitoring program to be implemented throughout the first two years of operation.