

# LNG CANADA

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Joint venture companies



## LNG Canada Canadian Environmental Assessment Agency 2015 – 2016 Annual Report

June 2016



# Table of Contents

<b>Executive Summary .....</b>	<b>5</b>
1. <b>Construction Activities within the Reporting Year .....</b>	<b>5</b>
2. <b>Community and Aboriginal Groups Communications and           Consultation .....</b>	<b>6</b>
3. <b>Conditions Performance .....</b>	<b>6</b>
<b>Acronyms/Abbreviations .....</b>	<b>8</b>
<b>Concordance Table.....</b>	<b>10</b>
<b>1.    Introduction .....</b>	<b>21</b>
1.1. <b>Project Overview .....</b>	<b>21</b>
1.2. <b>HSSE, Social Performance and Compliance Principles .....</b>	<b>21</b>
1.3. <b>HSSE Management System .....</b>	<b>22</b>
1.4. <b>Report Requirements .....</b>	<b>23</b>
<b>2.    Construction Update .....</b>	<b>24</b>
2.1. <b>Construction Activities within The Reporting Year .....</b>	<b>24</b>
2.2. <b>Implementation Schedule .....</b>	<b>25</b>
2.3. <b>Environmental Management Plans .....</b>	<b>25</b>
2.3.1. <b>Monitoring .....</b>	<b>26</b>
2.3.2. <b>Erosion and Sedimentation Control .....</b>	<b>27</b>
2.3.3. <b>Vegetation Management .....</b>	<b>28</b>
2.4. <b>Decommissioning .....</b>	<b>29</b>
2.5. <b>Transfer of Ownership.....</b>	<b>29</b>
2.6. <b>Records Management.....</b>	<b>29</b>
<b>3.    Regional Participation and Cooperation .....</b>	<b>30</b>
<b>4.    Communication and Consultation .....</b>	<b>31</b>
4.1. <b>Public Consultation .....</b>	<b>31</b>
4.2. <b>Notification of Consultation .....</b>	<b>31</b>
4.3. <b>LNG Canada Website.....</b>	<b>32</b>
4.4. <b>InFocus Magazine.....</b>	<b>32</b>
4.5. <b>Social Media .....</b>	<b>32</b>
4.6. <b>Community Advisory Group.....</b>	<b>32</b>

4.7.	Community Feedback Process.....	32
4.8.	Aboriginal Group Consultation .....	33
4.9.	Environmental Management Plan Consultation .....	34
5.	Emergency Preparedness and Response .....	35
5.1.	Emergency Response and Notification .....	36
5.2.	Communication Strategy .....	37
6.	Fish and Fish Habitat .....	39
6.1.	Marine Works.....	40
6.1.1.	In Water Construction .....	40
6.1.2.	Marine Mammals .....	40
6.2.	Fish and Amphibian Habitat .....	41
6.2.1.	Fish Salvage and Relocation .....	41
6.2.2.	Amphibian Salvage and Relocation .....	43
6.3.	Habitat Offsetting Plan .....	44
6.3.1.	Off-Channel Habitat Creation and Coho Seeding .....	46
6.3.2.	Implementation and Monitoring .....	48
7.	Wetlands .....	51
7.1.	Wetland Protection Mitigations .....	51
7.2.	Wetland Compensation Plan .....	53
7.2.1.	Implementation and monitoring .....	54
8.	Migratory Birds .....	56
8.1.	Noise and Light Management.....	56
8.2.	Timing Restrictions and Buffer Zones .....	56
8.3.	Monitoring .....	58
8.4.	Osprey .....	58
8.5.	Marbled Murrelet .....	59
9.	Human Health.....	60
9.1.	Noise Complaints .....	60
9.2.	Marine Water and Sediment Quality .....	60
10.	Current Use of Lands and Resources for Traditional Purposes ....	62
10.1.	Archaeological and Heritage Resources Management Plan .....	62
10.2.	Marine Resources.....	63

## List of Appendices

APPENDIX I: .....	LNG Canada Site Map
APPENDIX II: .....	LNG Canada Project Rendering
APPENDIX III .....	LNG Canada Project CEEA Implementation Schedule
APPENDIX IV: ....	Monitoring & Reporting Example: Surface Water Management
APPENDIX V: .....	LNG Canada Aboriginal Consultation Plan
APPENDIX VI: .....	LNG Canada Fish Salvage Plan

# Executive Summary

LNG Canada is proposing to build and operate 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, temporary construction-related infrastructure and facilities, and shipping facilities.

On June 17, 2015, LNG Canada received the Canadian Environmental Assessment Act (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, 2015 to March 31, 2016 (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 approximately 26 million tonnes of 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 of 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 is a learning organization, and we are continually re-evaluating mitigation and monitoring measures throughout construction to verify that construction activities are 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**

During the reporting year, early works activities and investigative work commenced on the project site to facilitate ground preparation associated with the future construction of the Cedar Valley Lodge, a temporary workforce accommodation centre proposed to be located immediately adjacent to the LNG processing and storage site.

Additionally, water management, site access improvements, ground improvements, tree clearing for fish salvage, wildlife management, management of migratory birds, installation of contractor trailers, and management of fish and fish habitat activities occurred during the reporting year.

## **2. Community and Aboriginal Groups Communications and Consultation**

The commitment LNG Canada has made to transparent, frequent communications and consultation with Aboriginal 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 - all designed with input from stakeholders, residents and Aboriginal Groups

As well, during the reporting year, LNG Canada developed a formal 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 Aboriginal Groups that may be impacted by the Project are engaged and consulted on processes, activities, permits and conditions. LNG Canada's Senior Relationship Lead for each Aboriginal Group provides a single point-of-contact. During the reporting year, Aboriginal Groups were consulted during the development of a number of 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 local residents and Aboriginal Groups who rely on the environment for recreation and traditional use.

### **A) Fish And Amphibian Habitat And Salvage**

During this reporting year, LNG Canada commenced fish salvage activities, resulting in over 20,000 fish salvaged and relocated, with fish mortality rates at below 2%. Amphibian salvage has been equally successful, with over 8,000 amphibians captured and relocated, and over 1200 eggs and egg masses successfully relocated. No construction in the marine environment took place in the reporting period.

### **B) Wetlands**

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. This Plan has been developed in consultation with Environmental Assessment Office, Environment Canada, Aboriginal Groups and Forests, Lands and Natural Resource Operations.

### **C) Migratory Birds**

Over the reporting year, LNG Canada undertook tree-clearing activities in accordance with LNG Canada's Wildlife Management Plan and Raptor Management Plan. These Plans identify a number of mitigations to protect migratory birds, including reducing light and noise pollution; adhering to timing and restricted activity windows; and adhering to provincial and federal setback distances.

### **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. LNG Canada applies best management practices for construction noise from the British Columbia Oil and Gas Commission's *Noise Control Best Practices Guidelines*.

### **E) Archaeological And Heritage Resources**

LNG Canada's fieldwork conducted in 2013 and 2014, according to its BC Heritage Conservation Act Heritage Inspection Permit, identified potential areas of archaeological or cultural significance. The fieldwork identified two sites – one in the vicinity of the haul road and the other at the north end of the LNG Loading Line. No construction work took place in this reporting year in the vicinity of either of these sites.

### **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

AIA	Archaeological Impact Assessment
BAT	Best Available Technology
BC	British Columbia
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
CWS	Canada Wildlife Service
DFO	Fisheries and Oceans Canada
DOK	District of Kitimat
EAC	Environmental Assessment Certificate (BC)
EAO	Environmental Assessment Office (BC)
EC	Environment Canada
EM	Environmental Monitor
EMA	Emergency Management Act (BC)
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESC	Erosion and Sediment Control
EWP	Environmental Work Plan
FAA1	<i>Fisheries Act Authorization – LNG Canada Workforce Accommodation Centre (15-HPAC-00918)</i>
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
LNG	Liquefied Natural Gas
MAP	Marine Activities Plan
MOE	Ministry of Environment (BC)
MOH	Ministry of Health (BC)
NGO	Non-Governmental Organization
OGAA	Oil and Gas Activities Act (BC)
OGC	Oil and Gas Commission (BC)
PCJV	Pacific Coast Joint Venture
PSO	Project Site Office
RAP	Response Action Plan
STL	Shovel Test Location
VES	Visual encounter survey
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; <ul style="list-style-type: none"> <li>provide sufficient information and a reasonable period of time to permit the party or parties to prepare their views;</li> <li>provide a full and impartial consideration of any views presented;</li> <li>and advise the party or parties that have provided comments on how the views and information received have been considered.</li> </ul>	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	4.0

Section Topic	Description	Clause	Sub clause	Report Section
General Conditions	<p>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);</p> <ul style="list-style-type: none"> <li>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</li> <li>implement additional mitigation measures, as appropriate</li> </ul>	2.4	2.4.1 2.4.2 2.4.3 2.4.4	2.3
General Conditions	<p>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:</p> <ul style="list-style-type: none"> <li>implementation activities undertaken in the reporting year for each of the conditions;</li> <li>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;</li> <li>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</li> <li>any additional mitigation measures implemented or proposed to be implemented, as determined under condition 2.4</li> </ul>	2.5	2.5.1 2.5.2 2.5.3 2.5.4 2.5.5	1.4
General Conditions	<p>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.</p>	2.6	2.6	1.4 4.0
General Conditions	<p>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.</p>	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
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	6.2
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 3.9.4	6.1

Section Topic	Description	Clause	Sub clause	Report Section
	<p>identify the construction activities that generate underwater noise levels greater than 160 decibels and the periods of time when those activities will occur;</p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>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</li> <li>specify mitigation measures, such as sound dampening technology and soft-start procedures to reduce construction noise levels in the exclusion zone.</li> </ul>		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	<p>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:</p> <ul style="list-style-type: none"> <li>on migratory birds and their habitats;</li> <li>on terrestrial species, including amphibians and reptiles, and their habitats;</li> <li>on species at risk and their habitat;</li> <li>on the current use of lands and resources for traditional purposes by Aboriginal peoples;</li> <li>on navigation;</li> <li>from potential sources of contamination including polycyclic aromatic hydrocarbons, dioxins, furans, copper and zinc on the receiving environment.</li> </ul>	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	6.3
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
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: <ul style="list-style-type: none"> <li>• delineate clearing boundaries prior to the commencement of construction and respect those boundaries during construction;</li> <li>• 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;</li> <li>• manage surface water and avoid erosion or sedimentation to maintain hydrology of adjacent wetlands and protect water quality; and</li> <li>• 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.</li> </ul>	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: <ul style="list-style-type: none"> <li>• implementing a 2:1 ratio of compensation area to the loss of ecologically important wetland area;</li> <li>• 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;</li> <li>• a preference for wetland restoration over enhancement, and wetland enhancement over creation; and</li> </ul>	4.3	4.3.1 4.3.2 4.3.3 4.3.4	7.2

Section Topic	Description	Clause	Sub clause	Report Section
	<ul style="list-style-type: none"> <li>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.</li> </ul>			
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 8.2 8.4
Migratory Birds	<p>The Proponent shall:</p> <ul style="list-style-type: none"> <li>restrict flaring of vented emissions to the minimum required for maintenance activities or to manage emergencies;</li> <li>minimize flaring during night time and during periods of bird vulnerability; and</li> <li>adjust operational lighting to avoid attracting migratory birds.</li> </ul>	5.2	5.2.1 5.2.2 5.2.3	8.1
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	8.3
Migratory Birds	The Proponent shall avoid or lessen, and monitor effects on the habitat of the Marbled Murrelet ( <i>Brachyramphus marmoratus</i> ), 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	8.5
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
	<ul style="list-style-type: none"> <li>complying with the Waste Discharge Regulation under British Columbia's Environmental Management Act for operational air emissions;</li> <li>applying best management practices and guidance for construction noise from the British Columbia Oil and Gas Commission's Noise Control Best Practices Guidelines; and</li> <li>complying with the operational noise requirement of the British Columbia Oil and Gas Commission's Liquefied Natural Gas Facility Regulation.</li> </ul>			
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	<p>The Proponent shall implement measures related to marine water quality and sediment quality, including:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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;</li> <li>implementing mitigation measures to minimize sediment dispersion during in-water construction activities, including isolation methods;</li> <li>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;</li> <li>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;</li> <li>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.</li> </ul>	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	<p>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:</p> <ul style="list-style-type: none"> <li>• location and timing of Designated Project-related construction activities;</li> <li>• location and timing of traditional activities by Aboriginal groups;</li> <li>• safety procedures, such as navigation aids and updated navigational charts;</li> <li>• location of areas where navigation is restricted for safety reasons;</li> <li>• 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;</li> <li>• ways in which to provide feedback to the Proponent on adverse effects related to navigation experienced by Aboriginal groups and other local marine users.</li> </ul>	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	<p>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.</p> <p>The follow-up program shall include:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• providing the results of the follow-up program and any corrective actions taken to Aboriginal groups.</li> </ul>	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	10.2

Section Topic	Description	Clause	Sub clause	Report Section
archaeological, paleontological or architectural significance	<p>account British Columbia's Handbook for the Identification and Recording of Culturally Modified Trees. The Archaeological and Heritage Resources Management Plan shall include:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• 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</li> <li>• 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.</li> </ul>			
Decommissioning	<p>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:</p> <ul style="list-style-type: none"> <li>• 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;</li> <li>• the components of the Designated Project that will be decommissioned by the Proponent;</li> <li>• the desired end-state objectives of the areas that will be decommissioned by the Proponent and those that will not be decommissioned;</li> <li>• 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;</li> <li>• how the Proponent will monitor and mitigate adverse environmental effects from decommissioning activities;</li> <li>• how the Proponent will conduct in-water and land-based decommissioning activities (including the location, the scheduling and sequencing of activities);</li> <li>• a strategy for progressive reclamation, if appropriate; and</li> <li>• an approach to consulting Aboriginal groups and federal and provincial authorities throughout the decommissioning phase.</li> </ul>	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	<p>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:</p> <ul style="list-style-type: none"> <li>the decommissioning activities that took place during the reporting year;</li> <li>any adverse environmental effects identified by the proponent with respect to those decommissioning activities;</li> <li>a description of the mitigation measures that were implemented by the Proponent to mitigate or reduce those adverse effects, and consultation activities.</li> </ul>	9.2	9.2.1 9.2.2 9.2.3 9.2.4	2.4
Accidents or Malfunctions	<p>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.</p>	10.1	10.1	5.0
Accidents or Malfunctions	<p>In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall:</p> <ul style="list-style-type: none"> <li>notify relevant federal and provincial authorities, including the Agency of the occurrence as soon as possible;</li> <li>implement measures to minimize any adverse environmental effects associated with the occurrence as soon as possible;</li> <li>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.</li> </ul> <p>The written report must include:</p> <ul style="list-style-type: none"> <li>10.2.3.1 the measures that were taken to mitigate the effects of the occurrence;</li> <li>10.2.3.2 a description of any residual environmental effects, and any additional measures required to address residual environmental effects; and</li> <li>10.2.3.3 if an emergency response plan was implemented, details concerning its implementation.</li> <li>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.</li> </ul>	10.2	10.2.1 10.2.2 10.2.3 10.2.4	5.1
Accidents or Malfunctions	<p>The Proponent shall prepare and implement a communication strategy in consultation with Aboriginal groups that shall include:</p> <ul style="list-style-type: none"> <li>the types of accident or malfunction requiring a notification to the respective Aboriginal groups;</li> <li>the manner by which Aboriginal groups shall be notified of an accident or malfunction and of any opportunities to assist in the response; and</li> <li>points of contact for the Proponent and for the respective Aboriginal groups.</li> </ul>	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	<p>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:</p> <ul style="list-style-type: none"> <li>the place, date and time of any sampling, as well as techniques, methods or procedures used;</li> <li>the dates and the analyses that were performed;</li> <li>the analytical techniques, methods or procedures used in the analyses;</li> <li>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</li> <li>the results of the analyses.</li> </ul>	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 Development Inc. (LNG Canada) is proposing to develop a liquefied natural gas (LNG) production and export terminal, in the District of Kitimat (DOK), British Columbia (BC). The LNG Canada Project (Project) is comprised of a liquefied natural gas (LNG) facility and supporting infrastructure; temporary construction-related infrastructure and facilities; and shipping 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 Canadian Environmental Assessment Act (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 proposed 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 (Refer to Appendix I: LNG Canada Site Map).

The Project is located in the traditional territory of the Haisla Nation and the Project's associated 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," each with the capacity to produce 6.5 million tonnes per annum of LNG annually, 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.

Refer to Appendix II: LNG Canada Rendering.

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

## 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 and 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 publically 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 a number of ways through design and execution of the Project. Examples include:

- Use of existing infrastructure, such as BC Hydro supplied grid with hydroelectric power output to ensure the lowest feasible greenhouse gas footprint;
- Use of existing industrial development area for the LNG Plant site and refurbishing existing harbor 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 CEAA conditions outlined in CEAA Decision Statement Issued under Section 45 of the Canadian Environmental Assessment Act, 2012 to LNG Canada Development Inc. (“CEAA Decision Statement”).

As per the CEAA Decision Statement, for the purposes of this report, the reporting year is defined as April 1, 2015 – March 31, 2016.

The LNG Canada CEAA Annual Report can be accessed at the LNG Canada website ([www.lngcanada.ca](http://www.lngcanada.ca)).

## 2. Construction Update

### 2.1. Construction Activities within the Reporting Year

During the reporting year, early works activities took place at the Project site to facilitate ground preparation associated with the construction of Cedar Valley Lodge.

Early works/site preparation construction activities commenced on November 12, 2015, following approval received from the BC Environmental Assessment Office (EAO) on 23<sup>rd</sup> October, 2015. BC EAO confirmed that the Environmental Assessment Certificate (EAC) specific to Environment Management Plans (EMP) had been met. Site activities were limited through the months of January and February, 2016, with the majority of site preparation construction activities starting in March, 2016. Activities in the reporting year include:

- Water management throughout the Project site, including installation of erosion and sediment controls prior to construction;
- Wildlife management activities, including wildlife monitoring; den surveys prior to tree clearing activities; and removal of potential beavers and their dams;
- Management of migratory birds, including relocation of an Osprey nest from the wharf to an area away from construction activities; and completion of bird nest surveys prior to tree clearing activities;
- Management of fish and fish habitat, including installation of fish exclusion fences and associated fish and amphibian salvage;
- Facilitation of a number of formal regulatory inspections by the BC Oil and Gas Commission (OGC), EAO and Haisla Nation;
- Site access improvements, including construction of temporary access roads and logging roads with culverts; installation of temporary bridges, and associated survey work; and
- Tree clearing throughout the Cedar Valley Lodge construction area for access to fish salvage areas and in preparation for infilling activities, and associated survey work.

Other activities at the Project site consisted of ground improvements and the installation of various contractor trailers within the project office complex; regulatory tours, inspections and interfacing associated with permit applications and approvals; and hauling of various materials and equipment to site to facilitate construction activity.



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

## **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 publically available on the LNG Canada website ([www.lngcanada.ca](http://www.lngcanada.ca)) and is available for reference as Appendix III.

The LNG Canada Project Implementation Schedule was submitted to CEAA and Aboriginal Groups on September 15, 2015, more than 30 days prior to construction activities commencing.

A subsequent update to the Implementation Schedule was submitted to CEAA and Aboriginal Groups on April 20, 2016. The updated Implementation Schedule reflects changes in start dates for construction activities in the marine environment from January 1, 2016 to January 1, 2017.

The first bi-annual Implementation Schedule update will be submitted to CEAA by June 30, 2017 as per CEAA Decision Statement Condition 11.2 *“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.”*

## **2.3. Environmental Management Plans**

The LNG Canada *Construction Environmental Management Plan* (CEMP) is the overarching framework that encompasses LNG Canada’s environmental management program, and includes all of the mitigation measures, best management practices, monitoring and reporting requirements associated with each Environmental Management Plan (EMP) being 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, Aboriginal Groups and stakeholders.

The CEMP also includes EMPs to manage environmental aspects and impacts related to this phase of 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.

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 plant 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 continually re-evaluating mitigation and monitoring measures throughout the construction phase to verify that construction activities are in compliance with regulatory requirements and in conformance with Project commitments.

LNG Canada has retained the services of Haisla-Triton, a joint-venture between Haisla Nation and Triton Environmental, to provide environmental monitoring services for the Project, including the services of a qualified environmental professional (QEP) to monitor construction activities. Environmental Monitors (EM) have been given the authority to stop work in cases where mitigations are not sufficient and in cases of non-compliance.

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.

Monitoring and reporting requirements for daily, weekly and monthly inspections and reporting are defined in each EMP. For example, LNG Canada contractors are required to do daily worksite inspections and assess effectiveness of housekeeping, erosion and sediment controls, discharge water quality parameters and presence/absence of invasive plants. An example monitoring program

put in place for surface water management is included for reference in Appendix IV. LNG Canada receives reports from the EMs and QEP on site on a regular basis.

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.

### **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 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 best practices and standard methods for ESC. The most significant mitigation measures for ESC include minimizing cleared/disturbed areas, installation of silt and sediment fences and blankets, construction of settling ponds, tree and vegetation preservation, and installation of lined channels.

To ensure effectiveness of ESC mitigations, water quality downstream of construction activities is continually monitored to ensure that sediment is prevented from entering surface water. Daily inspections of sediment and erosion control measures, fish and wildlife protection measures and dust mitigations take place. If downstream water quality is impacted by sediment, all construction activities upstream are stopped until the situation is assessed and additional ESC mitigations are installed, if required.

During the reporting year, LNG Canada made several improvements to ESC mitigations at the Project Site Office (PSO) after turbid water was observed in the Project area. Construction activities in the area were stopped and vehicle traffic was diverted around the Project Site Office (PSO) to prevent further creation of turbid water.

After assessing the situation, additional mitigations were implemented, including but not limited to:

- Changing parking lot resurfacing materials from crushed gravel to 3" washed rock;

- Installation of non-woven geotextile fabric in existing ditches to prevent erosion of the channel;
- Installation of straw wattles and riprap in ditches to slow water flow and allow sediment to settle out of turbid water prior to entering the stormwater system;
- Installation of interceptor sumps to allow sediment to settle out of turbid water prior to entering the stormwater system; and
- Establishing processes to assess weather conditions and potential impacts on ESC prior to starting work each day, as well as at the end of each day.

The learnings from this event were shared throughout LNG Canada and applied to other areas of the site during earth moving activities.

### **2.3.3. Vegetation Management**

LNG Canada developed a Vegetation Management Plan in consultation with BC Forests, Lands and Natural Resource Operations (FLNRO), OGC and Haisla Nation in 2015. The Vegetation Management Plan outlines mitigation measures pertaining to red and blue-listed plants and communities. The final Vegetation Management Plan was provided to Haisla Nation and the Environmental Assessment Office (EAO) in mid-2015, and to other applicable regulatory agencies in January of 2016. Construction activities undertaken in the reporting year did not impact red and blue-listed plants and communities.

LNG Canada received *Fisheries Act Authorization – LNG Canada Workforce Accommodation Centre (15-HPAC-00918)* (FAA1) from Fisheries and Oceans Canada (DFO) for construction of the Cedar Valley Lodge, authorizing the following:

- Destruction of 27,085 m<sup>2</sup> of wetland and off-channel aquatic habitat and associated riparian vegetation from grubbing, clearing, excavation and infilling; and
- Death of fish remaining in these habitats after implementation of the mitigation measures outlined in the *Fish Salvage Plan* for LNG Canada.

LNG Canada will undertake riparian habitat re-vegetation as part of the habitat offsetting requirements defined by DFO. Restoration of riparian areas disturbed during construction of fish habitat will be managed using a staged approach, which is outlined in detail in Section 6.3.

Grubbing and clearing activities under FAA1 began in early March, 2016. No re-vegetation will take place in the area of Cedar Valley Lodge, as the area is designated for surface development.

The extent of re-vegetation related to the Wetland Compensation Plan is currently being determined in conjunction with DFO (Refer to Section 7.2).

## **2.4. Decommissioning**

No decommissioning activities took place during the reporting year. LNG Canada will develop a Decommissioning Plan prior to decommissioning the facility. The Decommissioning Plan will be developed in consultation with Aboriginal Groups and 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:

- 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; and
- An approach to consulting Aboriginal 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. 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 available at the Project site, and include, but are not limited to:

- 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, Aboriginal Groups and external stakeholders; and
- Incident reporting and investigation documentation.

### 3. Regional Participation and Cooperation

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

During the reporting year, LNG Canada began participation in the BC Ministry of Environment (MOE) Water Quality Objectives Development for the Kitimat River and Arm Stakeholder Group (Stakeholder Group). The Stakeholder Group is comprised of government and industry partners, including representation from the MOE, FLNRO, Haisla Nation, industry players, local government, non-governmental organizations (NGOs) and residents of the Kitimat community.

The purpose of the Stakeholder Group is to characterize current water quality conditions for the Kitimat River and tributaries, identify legacy issues and assess potential for cumulative impacts related to water quality as a result of proposed and changing development in the Kitimat area. In 2016, the Stakeholder Group will focus on:

- Supporting the MOE with data collation mining to compile information on the Kitimat River and tributaries (e.g. water licenses, discharges, hydrology, water quality, etc.);
- Development of a Project Charter to identify scope and objectives of the Stakeholder Group and related project; and
- Design of a monitoring program for 2017 and beyond based on the information gathered during data collation mining exercise.

In addition to partnerships related to cumulative effects monitoring, LNG Canada also consults with regional groups on development of policies and mitigations as appropriate. For example, the Pacific Coast Joint Venture (PCJV) was involved in defining wetland compensation measures aligned with the PCJV mandate of ensuring wild birds have access to abundant and diverse habitats.

## 4. Communication and Consultation

LNG Canada undertakes a range of initiatives to ensure the community and Aboriginal 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, open houses the Community Feedback Process and in-person meetings.

### 4.1. Public Consultation

During the reporting year, LNG Canada consulted with public audiences on a range of topics about the Project, including project plans, conditions and permits. These include, but are not limited to the development of a number of LNG Canada management plans, the Community Level Infrastructure and Services Management Plan, the Community Feedback Process, the BC OGC LNG Facility Permit Application and the Disposal at Sea Permit Application. LNG Canada consulted with local municipalities and departments, agencies, interested residents, stakeholders and the Community Advisory Group.

In addition to in-person meetings and workshops, LNG Canada held the following open houses to share information and collect feedback:

- Mid 2015 – Information sharing related to the LNG Canada permitting processes, including the BC OGC LNG Facility Permit Application.
- September 2015 – Open house focused on providing an update on project activities and seeking input into the development of the LNG Canada Community Feedback Process (refer to Section 4.2).
- March 7, 2016 - Open house focused on providing an update on project construction activities and addressing community questions and concerns.

### 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, resident letters, billboards, required Gazette advertisements, and through other forms of notification.

### **4.3. LNG Canada Website**

The LNG Canada Website provides information on the Project and allows LNG Canada to communicate significant project events and milestones to the public. 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 will also be made available via the website.

### **4.4. InFocus Magazine**

InFocus magazine, LNG Canada's newsletter, is distributed on a quarterly basis to the Kitimat and Terrace communities. InFocus provides information about LNG Canada's activities, upcoming events and opportunities to provide feedback. In addition to the LNG Canada InFocus magazine, advertisements are regularly placed in local newspapers to provide project updates, including site activities and permitting processes, and to advertise opportunities for feedback.

### **4.5. Social Media**

During the reporting year, LNG Canada launched its official Facebook community page. The purpose of the LNG Canada page is to engage with communities and share information on LNG Canada operations, events, and to provide the public with project updates and notifications. 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 13 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.

### **4.7. Community Feedback Process**

During the reporting year, 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 a variety of ways, including:

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

Consultation was undertaken to collect input on the proposed concept for the process through a community survey, workshops, open houses and meetings. Input collected was considered in finalizing the Community Feedback process.

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

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

#### **4.8. Aboriginal Group Consultation**

The Senior Relationship Lead for each Aboriginal 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 Aboriginal Groups throughout the environmental assessment, including ongoing engagement post-EAC. To ensure that these methods continue to support Aboriginal Groups' desired level of participation in the Project, in September 2015, a letter was sent to all Aboriginal Groups seeking confirmation that the consultation methods and activities undertaken throughout the environmental assessment process to that point were still an appropriate means of engagement as the Project progressed. No specific comments or concerns were received from Aboriginal Groups in response to this letter, and LNG Canada continues to implement the Aboriginal Consultation Plan and methods as approved. Refer to Appendix V.

Underpinning the various consultation tools that are described in the Aboriginal Consultation Plan are the Senior Aboriginal Consultation and Relationship Leads for each Aboriginal Group, who provide continuity of communications and a focal contact for all consultation that is related to the Project.

Methods of engagement used to-date include, but are not limited to, face-to-face meetings, e-mails, phone calls, letter communications, community meetings, site-visits, quarterly project update meetings, and other methods that may be preferred or requested by individual Aboriginal Groups through the consultation process. Each of these engagement tools provides an opportunity for ongoing information sharing and feedback regarding the Project.

#### **4.9. Environmental Management Plan Consultation**

During the reporting year, Aboriginal Groups were consulted during the development of a number of LNG Canada EMPs for construction. In addition, all of LNG Canada's communications tools are available to all Aboriginal Groups to access up-to-date information about the Project and provide feedback on an individual basis.

LNG Canada continually engages with regulatory agencies and interest groups to share project information and seek feedback on specific topics of interest. In May 2015, LNG Canada began engagement with Aboriginal 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*

LNG Canada initiated engagement on the CEMP and EMPs with Aboriginal Groups prior to the completion of draft documents to allow time to consider and incorporate comments and feedback collected into the versions submitted to EAO and other regulatory agencies. The EMPs were provided to EAO and other regulatory agencies in August 2015 for comment. Comments were incorporated into amended management plans, which were finalized in September 2015.

LNG Canada continues to engage with regulatory agencies and Aboriginal Groups and provide updates on the development and implementation of management plans. The CEMP and EMPs will be continually reviewed and revised as appropriate as part of LNG Canada’s approach to adaptive management.

## 5. Emergency Preparedness and Response

While there were no Accidents and Malfunctions at the LNG Canada Project during the reporting year, during the construction or operation of the proposed Project, unplanned events could arise from accidents or malfunctions associated with Project activities, resulting in impacts to environmental, social, health, heritage or economic values.

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.

Accidents and malfunctions as defined in the application are summarized in Table 5-1: Accidents and Malfunctions.

**Table 5-1: Accidents and Malfunctions**

<b>Accident or Malfunction Scenario</b>	<b>Applicability to Reporting Year</b>
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	Not applicable to construction
Marine vessel grounding and collisions, including collisions with marine mammals and loss of cargo	Not applicable to reporting year

Loss of containment of LNG, emergency LNG shutdown and explosion and fire are not applicable to the construction phase of the Project as defined in the Application, as there is no LNG on site. Construction work in the marine environment has not commenced, therefore marine vessel grounding and collisions does not apply to the reporting year.

The most likely scenario is a spill of relatively small amounts of lubricating oils, fuels or other equipment fluids, which may occur through refueling or leaks from machinery or valves. Such spills are typically localized, limited to the required containment areas and the bermed Project footprint, and readily cleaned up by onsite crews using standard equipment and materials.

The following key mitigation measures have been implemented to reduce the likelihood of a spill occurring during construction:

- Best Management Practices (BMPs) for worker awareness, including communication around hazardous materials storage requirements and secondary containment requirements on site;
- BMPs for equipment maintenance and inspection;
- Spill prevention and containment measures, with secondary containment, where required;
- Storage, refuelling and maintenance areas located a minimum of 30 m from water bodies or sensitive areas; and
- Spill kits available on site and spill response and reporting procedures and processes in place.

### **5.1. Emergency Response and Notification**

LNG Canada emergency procedures are in place to ensure timely and effective decision making during 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 the LNG Canada commitment to health, safety and the environment; description of ICS; roles, responsibilities; requirements and frequency of training and exercises; and initial response actions and notification requirements.

A site-specific emergency response plan has been developed for construction activities, which contains detailed information related to emergency response resources, notification requirements and modes of emergency communication.

Response Action Plans (RAPs) for the most probable emergency scenarios are an integral part of the Construction ERP. The Construction ERP contains detailed information to support incident

response including information on emergency response resources, notification requirements and modes of emergency communication.

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, including CEAA, as soon as possible.

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

LNG Canada will submit a written report to CEAA as soon as possible, within 30 days post-incident. The report will include information on the implementation of emergency response, implemented mitigations and measures to address residual environmental effects.

LNG Canada will conduct an investigation into the incident to determine root causes, and submit a report to CEAA within 90 days outlining actions taking place to prevent a recurrence of the incident.

## **5.2. Communication Strategy**

LNG Canada has developed a communication strategy to ensure that Aboriginal Groups are informed of accidents and malfunctions that may arise at the LNG Canada site as per the scenarios identified in the *LNG Canada CEAA Application*, including:

- Spills of hazardous materials (not including LNG);
- Loss of containment of LNG at the LNG processing and storage site;
- Emergency LNG facility shutdown;
- Explosion and fire; and

- Marine vessel grounding, and marine vessel collisions (e.g. with the wharf, a non-tug assisted vessel, or a marine mammal), including loss of cargo, where applicable.

During construction, scenarios related to loss of containment of LNG, emergency facility shutdown, explosion, fire and marine vessel incidents do not apply.

The LNG Canada CEAA Application predicted that the magnitude of the environmental effect of a spill would likely be localized and that mitigations in place adequately reduce the likelihood of a spill occurring.

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

- Not localized and not within containment (i.e. spills to water and air); or
- Not within the Project footprint (i.e. spills that have migrated off site); or
- Not readily cleaned up (i.e. incidents that trigger a larger response such as ICS mobilization)

The communication strategy includes the criteria outlined above, as well as a description of how Aboriginal Groups will be notified, and points of contact for those respective Aboriginal Groups, as well as LNG Canada representatives.

## 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 local residents who rely on the environment for recreation and traditional use.

A number of plans have been developed in consultation with regulatory agencies and potentially affected Aboriginal 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; and
- 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.

A number of 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, for example, uses an intake screen sized to prevent fish from entering the intake, and will use passive technology to ensure that the entrance velocity of the intake is less than the flow of the river to prevent incidental impacts to fish. 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**

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

The CEAA Implementation Plan was resubmitted to reflect changes in the start date of proposed marine activities from January 1, 2016 to January 1, 2017.

### **6.1.1. In Water Construction**

LNG Canada is developing a *Marine Activities Plan* (MAP), which will define requirements and mitigations for marine work, including but not limited to:

- Preferred timing windows for construction;
- Underwater noise during piling activities;
- Dredge management (dredging, sediment control and disposal at sea);
- Marine wildlife management;
- Marine traffic management, including speed profiles; and
- Marine waste management.

The MAP will be developed in consultation with regulatory agencies and Aboriginal Groups as required.

### **6.1.2. Marine Mammals**

LNG Canada will develop the *Marine Mammal Management and Monitoring Plan* in consultation with DFO, OGC and Aboriginal Groups as part of ongoing consultation on the MAP. The *Marine Mammal Management and Monitoring Plan* will define an exclusion zone for all construction activities where underwater noise affect behavior or cause injury to marine mammals.

A marine mammal observer will be employed to observe and report on marine mammal sightings within the exclusion zone during construction, and the *Marine Mammal Management and Monitoring Plan* will define criteria for stopping and restarting work in the case that marine mammals are observed within the exclusion zone.

Engagement with Aboriginal groups regarding the implementation of the *Marine Mammal Management and Monitoring Plan* will take place with the commencement of marine construction in 2017.



## **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* outlines requirements to protect freshwater fish habitat at the Project site during construction.

The *Fish Habitat Management Plan* identifies regulatory requirements, stakeholder and Project commitments related to fish habitat management; identifies project activities and environmental effects associated with freshwater fish habitat; and outlines measures to avoid or mitigate impacts to fish and fish habitat.

FAA1 provides LNG Canada with authorization to construct Cedar Valley Lodge, 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:

1. Destruction of 27,082 m<sup>2</sup> of Beaver Creek wetland and off channel aquatic habitat and associated riparian vegetation from grubbing, clearing, excavation and infilling; and
2. Death of fish remaining in these habitats after implementation of mitigations outlined in the LNG Canada Fish Salvage Plan (Appendix VI)

During construction activities, LNG Canada ensures that mobilization of sediment is controlled as per Section 2.3.2 of this report. Proper instream construction techniques and supervision are adhered to, including maintenance of fish passage through proper design and installation of all culverts and bridges. Timing of water withdrawals is undertaken in accordance with approved species timing windows and those requirements outlined in FAA1.

During the reporting year, LNG Canada initiated fish and amphibian salvage programs in the Cedar Valley Lodge construction area to prepare for dewatering activities to take place in the second quarter of 2016. Prior to dewatering or infilling, fish-bearing habitats are isolated from flow and adjacent fish bearing areas. Fish and amphibians are salvaged from the isolated work areas and released into suitable habitat away from construction activities.

Installation of fish isolation fences, related fish and amphibian salvage commenced in the Cedar Valley Lodge construction area in November 2015. Salvage activities continued until mid-December and did not recommence until early March 2016.

### **6.2.1. Fish Salvage and Relocation**

LNG Canada has received BC FLNRO *Permit No. SM15- 184199 Fish Collection Permit* allowing collection of fish from non-tidal waters within Beaver Creek and tributaries, Anderson Creek and tributaries and the Kitimat River. In conjunction with the FLNRO Permit, LNG Canada has also received DFO *License 391559 XHAB 121 2015*, allowing for collection and relocation of salmon

species and eulachon. Together, and aligned with FAA1, these permits authorize LNG Canada to undertake fish salvage and relocation prior to dewatering and infilling activities as part of Cedar Valley Lodge construction.

The figures provided in the *Fish Salvage Plan* (Appendix VI) provide an overview of the Cedar Valley Lodge areas requiring fish salvage.

The *Fish Salvage Plan* was provided as part of FAA1. The Fish Salvage Plan provides information on fish species and life stages within the project footprint, project setting and fish salvage access, proposed fish salvage methodologies and reporting requirements. The Fish Salvage Plan also provides detailed information on spawning, rearing and overwintering habitat.

Repetitive, intensive backpack electrofishing is the preferred method of salvage while water temperatures are above 5°C, as electrofishing is the most efficient method to capture a range of species and life stages present. Electrofishing also offers the lowest mortality and injury rates for fish. When water temperatures are below 5°C, minnow trapping, beach seining and dip netting are used. For Cedar Valley Lodge salvage activities, three to four standard crews are used, comprised of a supervisor, a technical assistant and a fish runner to ensure continuous fishing effort and to minimize fish stress.

Fish salvage activities involved the installation of fish exclusion fences throughout the Cedar Valley Lodge area. These fences were utilized to segment stream reaches to allow a systematic approach in fish salvage efforts. This also allowed construction and dewatering to work concurrently with salvage activities. Fish exclusion fences are inspected throughout the duration of their installation to ensure that fence integrity is maintained, and breaches of the fences do not result in fish reaching isolated channels.

All channels (perennial and ephemeral) are marked every 50 – 100 m with survey flags to facilitate identification of any required reference sites during subsequent salvages. All pumped drawdown methods follow the Freshwater Intake End-of-Pipe Fish Screen Guideline established by DFO (1995). Immediately following each drawdown of water (i.e. 25%, 50% and 75% of ambient flow), fish are salvaged from remaining wetted areas. Downstream areas are monitored after each drawdown cycle to ensure that any stranded fish are salvaged.

Waterbodies are deemed fish free as designated by QEP on site, who determines a measure of effort vs. fish catch aligned with industry standard. Fish free designation and related measure of effort varies depending on habitat characteristics and location that is being salvaged.

All salvaged fish are released unharmed into habitat types that are similar to those they were salvaged from. Preliminary fish relocation sites have been identified in the Fish Salvage Plan, although the

exact locations of relocation are subject to ambient conditions such as discharge, access and connectivity to fish-bearing waters.

Installation of fish exclusion fencing commenced within the Kitimat River side channel in August 2015. This mitigation attempt proved to be unsuccessful and was dismantled in September 2015.

Fish salvage activities within the Cedar Valley Lodge construction area, including the reinstallation of fish exclusion fencing, began in November 2015. To date, the fish salvage program for the Cedar valley Lodge construction area has resulted in over 20,000 fish of various species salvaged and relocated. The fish salvage program continues to be successful, with fish mortality rates below 2%. Final fish salvage numbers, as well as related mortality information, will be submitted to DFO and FLNRO as per the related permits.

### **6.2.2. Amphibian Salvage and Relocation**

LNG Canada has received BC FLNRO *Wildlife Permit No. SM15- 178793*, which authorizes live capture, temporary possession, transport and release of Western Toad, Columbia Spotted Frog, Northwestern Salamander and Coastal Tailed Frog for the purposes of salvage prior to construction.

Amphibian salvage activities take place in conjunction with fish salvage activities and Cedar Valley Lodge areas that require amphibian salvage are aligned with areas that are salvaged for fish (Appendix VI). As with fish, release of amphibians always takes place in similar habitats to which the amphibians were salvaged.

Coastal Tailed Frogs inhabit steep mountain streams and are unlikely to be present in the Cedar Valley Lodge area, which is low-lying. Northwestern Salamanders are found in aquatic habitats in breeding areas year-round and are being salvaged concurrently with fish salvage efforts using minnow traps as recommended in the *Best Management Practices for Amphibian And Reptile Salvages In British Columbia*.

Western Toads, Columbia Spotted Frogs and Long-toed Salamanders are active largely on land, are to be salvaged using a combination of pitfall traps and visual encounter surveys (VES) as recommended in the BMP. Pitfall traps have been placed around ponds in the Cedar Valley Lodge construction area to capture any amphibians moving from forest areas towards aquatic habitat to breed.

Pitfall traps are constructed using silt fencing or plastic sheeting erected in a “Y” shape to make one array. The array will be oriented so that one fork of the “Y” faces away from shore to more effectively capture amphibians moving towards the pond. Fencing is held in place with wood stakes keyed into the ground to prevent amphibians from burrowing underneath. A bucket is placed into the ground at the end of each arm and at the apex of the “Y” so that the rim of the bucket is level with the ground.

A small amount of soil and woody debris is placed in the bottom of the buckets to provide shelter and substrate for captured animals. Pitfall traps are checked one to two times per day, and amphibians are processed and released at the designated locations.

VES take place throughout the Cedar Valley Lodge construction area wherever fish salvage will take place. Two trained workers walk the salvage area for one hour prior to construction activities commencing searching for amphibians in suitable habitat. Amphibians are processed and released at designated locations.

Amphibian salvage is most effective if adults are salvaged prior to breeding. In the event that breeding does occur in ponds, egg masses are collected in water-filled buckets and transported to the release location. Larvae will be collected using dip nets and minnow traps. Amphibian salvage activities at the Project adhere to strict hygiene protocols as per the *British Columbia Standard Operating Procedures: Hygiene Protocols for Amphibian Fieldwork, 2008* (MOE, 2008). All handling of amphibians takes place under direct supervision of a qualified professional trained in handling and identification of amphibians. Handling, possession and transport time for amphibians is minimized as much as practicable.

To date, the amphibian salvage program for the Cedar Valley Lodge construction area has resulted in the capture of over 8,000 amphibians, the majority being adults and juveniles. Over 1,200 eggs and egg masses have been successfully relocated.

Final amphibian salvage numbers, as well as related mortality information, will be submitted to regulatory agencies as per the related permits.

### **6.3. Habitat Offsetting Plan**

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 increasing the productive capacity of freshwater and estuarine habitats in the Kitimat River watershed and estuary.

In consultation with DFO, FLNRO, and affected Aboriginal Groups, a Habitat Offsetting Plan has been developed for the Cedar Valley Lodge area. Additional habitat gains and mitigations for other areas of the Project will be described in future reports.

Key considerations when developing the Habitat Offsetting Plan 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 Plan:

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

Throughout 2014 and 2015, biologists and other scientists have conducted numerous site visits, desktop and field studies to identify and assess the feasibility of various offsetting options. The proposed offsetting measures described in the Habitat Offsetting Plan represent the best available options for offsetting project-related impacts.

In developing the *Habitat Offsetting Plan* for the Cedar Valley Lodge construction area, potential adverse effects navigation was assessed and no impacts were identified. Adverse effects to migratory birds, terrestrial species and species at risk resulting from the Habitat Offsetting Plan were also assessed. No adverse effects were identified.

No adverse effects to lands and resources for traditional purposes were identified. All proposed offset projects are within the Haisla Nation traditional territory, and the Habitat Offsetting Plan was developed in consultation and with support from Haisla Nation.

There are no identified adverse effects on potential contamination resulting from the Habitat Offsetting Plan. Mitigations will be put in place as required should an issue with historic contamination arise during the implementation of the Habitat Offsetting Plan.

The total area of residual serious harm to fish from the construction of Cedar Valley Lodge in freshwater aquatic environments that requires offsetting is 27,085 m<sup>2</sup> of freshwater off-channel habitat. LNG Canada has adopted an offset-to-impact ratio of 2:1 to account for time-lag and uncertainty associated with implementation of the offsetting measures. LNG Canada will offset as outlined in Table 6-1: Cedar Valley Lodge Habitat Offsets.

**Table 6-1: Cedar Valley Lodge Habitat Offsets**

Habitat Type	Residual Serious Harm (m2)	Required Offsetting		Proposed Offsetting	
		Ratio	m2	Works	m2
Off-channel Rearing	24,721	1:1	24,721	West channel (parallel to Haisla Blvd)	3,750
				North channel (north of the project footprint)	5,400
				East channel (parallel to Rio Tinto Rail Line)	4,300
Off-channel Overwintering	2,364	2:1	4,728	Pond (NW corner of project footprint)	17,700
<b>Totals</b>	<b>27,085</b>		<b>29,449</b>		<b>31,150</b>

### 6.3.1. Off-Channel Habitat Creation and Coho Seeding

LNG Canada will create an off-channel habitat complex within the project footprint and adjacent to the Cedar Valley Lodge construction area that will provide perennial rearing and overwintering habitat in the vicinity of the seasonal rearing habitats that will be lost. These offset habitats will include a new pond/wetland and three new watercourses on the west, north, and east sides of the project footprint. Together, these will create 17,700 m2 of overwintering wetland habitat and 13,450 m2 of watercourse that is designed to provide perennial access to fish in all but drought conditions.

Design criteria used in development of the offset habitats include:

- Watershed areas for habitats will be maintained at pre-development levels
- Flows entering the project footprint will be concentrated into larger habitat features to all for creation of higher value habitats
- Channels will be graded to drain and prevent potential fish stranding if drought conditions occur in summer months
- Pond habitat will have a minimum water depth of 0.5 m, with deeper sections to provide perennial habitat
- Engineered log jams will be used to help control flow through the inlet of pond habitat
- Pond inlets will be armoured to reduce potential erosion and potential rerouting of side channels
- Edges of the pond areas will be planted with emergent wetland vegetation

- Habitat complexing will be achieved through placement of rootwads and other large woody debris
- Cut slopes, where not armoured using riprap or other techniques, will be hydroseeded and vegetated for bank stability
- Where not constrained by existing or proposed infrastructure, a riparian area consistent with Environmental Protection and Management Guidelines (OGC 2015) will be restored using native species

The pond will form part of a contiguous sequence of excavated channels and ponds that will connect fish habitats upstream of the Cedar Valley Lodge construction area with those downstream in Beaver Creek. The pond / wetland habitat will have a surface area of 17,700 m<sup>2</sup> and be excavated to depths that will provide overwintering habitat and perennial rearing habitat for fish. The shallows around the perimeter will have a shallow grade to promote colonization by emergent wetland vegetation.

The west watercourse will be approximately 374 m in length and run parallel to Haisla Boulevard. The channel will have a minimum 10 m wide riparian area on the west side of the channel and between 10 – 17 m wide riparian area on the east side of the channel, adjacent to Cedar Valley Lodge..

The north watercourse will be approximately 475 m in length and will have an average 20 m wide riparian area on the north side of the channel and a riparian area on the south side of the channel between 10 – 20 m wide.

The east watercourse will be approximately 475 m in length and will expand and enhance the existing channel along the west side of the RT rail line. The existing channel will be widened by a minimum of 7 m for its full length and then extended south for approximately 110 m. This east channel will have an average 20 m-wide riparian area on the west side of the channel; there is no change to the current riparian area on the east side of the channel.

Connection to the existing habitats upstream of the Cedar Valley Lodge site will be maintained by grading the west and north channels in a manner that matches the downstream inverts of the existing culverts under Haisla Boulevard. This will maintain the direct connection between habitats on the east and west sides of Haisla Boulevard and maintain fish access to upstream portions of the watershed. A new culvert will be installed under the Eurocan Haul Road to enhance fish passage between the offset habitats and downstream area of Beaver Creek.

Habitats will be complexed to improve habitat values for fish. Clean mixed gravel and cobbles will be placed on the bottoms of the west, north, and east channels to prevent erosion and provide substrates for invertebrate production. Log jams, root wads, boulder clusters, aquatic plants, and shrubs will be placed in pond habitat to provide fish cover and shading, and refuge for fish.

Offsets for fish mortality are proposed at a 2:1 replacement ratio (i.e., two fish to replace each predicted fish mortality). Juvenile Coho salmon will be seeded into appropriate areas of offsetting habitat proposed for the Project corresponding to estimated fish mortality for cold weather salvage, assuming a conservative 65% salvage efficiency.

The total number of fish required for seeding will be introduced into offset habitats over two years, beginning in the first season after habitat construction is complete. Although this introduces a degree of time lag between effect and offset, this approach has a number of benefits, including reducing the risk of skewing effectiveness-monitoring data and preventing the colonization by wild fish of, or displacing wild fish from, offset habitats. Furthermore, the estimate of juvenile Coho salvage capture efficiency is considered to be conservative and therefore, is expected to offset any time lag.

Off-channel areas of the Kitimat River susceptible to dewatering following spring freshet (and therefore sink habitats) will be identified and salvaged for Coho salmon that are at risk of stranding in isolated pools, depressions, and in the interstices of dewatered substrates. These rescued fish will be used to seed offset habitats over the first two years after construction. If the required number of juvenile Coho for seeding cannot be obtained through the salvage of stranded fish, the numbers will be augmented by hatchery-reared fish from a source located along the north coast of BC.

### **6.3.2. Implementation and Monitoring**

Construction of offset habitats will be undertaken in summer 2016. This will result in offset habitat being available to salmonids prior to fall rains and for overwintering and rearing in winter 2016/2017. Work areas will be salvaged of fish, dewatered and isolated. Therefore, no sensitive fish life stages will be affected and no in-water work timing windows apply. Riparian planting work will be completed in 2017. The intent of the timing for the riparian planting is to allow natural recolonization from the existing seedbank to start before in-fill planting is completed.

LNG Canada will implement a habitat effectiveness monitoring program, which will monitor the success of offsetting measures and determine whether they are functioning as intended. If offsetting measures are not functioning as intended, contingency measures will be implemented. The monitoring program has been developed, and will be implemented, with field participation by Haisla Nation.

The habitat effectiveness monitoring program will focus on both assessment of habitat functionality after construction and on compliance monitoring during construction. A key feature of the monitoring program will assess adherence to the conditions of FAA1.



The monitoring program will include employment of an EM onsite full time during construction, to be supervised by a QEP, to ensure adherence to construction and environmental requirements and mitigations. The EM will:

- Confirm that contractors are compliant with all regulatory requirements, including FAA1;
- Confirm that contractors are adhering to BMPs such as delineation of Project site boundaries and sensitive areas, appropriate upkeep and maintenance of equipment, erosion and sediment control, management of hazardous materials, and spill prevention planning; and
- Maintain monitoring documentation and prepare a summary report at the end of each month which includes, but is not limited to an overview of construction activities; observations; weather conditions; environmental incidents, issues and chance finds; non-compliances and corrective actions; and sampling data.

At the conclusion of offset construction, a report will be prepared summarizing reports prepared by the EM for distribution to DFO and Haisla Nation. The report will include “as built” drawings and a description of any modifications that were implemented during construction. This report will be submitted to DFO within 90 days of completion of construction of offsetting features.

Effectiveness monitoring of the offset habitats will commence one year following completion of construction and riparian planting. The objective of effectiveness monitoring is to confirm the habitats are functioning as intended and meet conditions of the Fisheries Act authorization. Specific success criteria, monitoring methods, and measurable parameters have been tailored to these offsetting features. Effectiveness monitoring will be conducted for ten years following construction, in Years 1, 2, 3, 5, 7, and 10.

To correct for natural variation in fish populations, two seasonally connected off-channel reference sites on the west side of the Kitimat River will also be monitored. The reference sites were visited in October 2015, at which time pond and channel habitats were identified and a range of fish species, including juvenile Coho, was captured. Effectiveness of offset habitats will be determined based on a series of success criteria that relate habitat conditions and fish utilization at the offset sites, relative to the impacted habitats (Table 8-2). In general, offset habitats will be considered successful if they are physically stable, accessible to fish, and exhibit physical and biological characteristics similar to the impact sites. Success criteria are summarized in Table 6-2: Habitat Effectiveness Success Criteria.

**Table 6-2: Habitat Effectiveness Success Criteria**

<b>Objective(s)</b>	<b>Measureable Parameter(s)</b>	<b>Success Criteria</b>
Riparian vegetation establishment and functionality	Survival rate for planted trees / shrubs Trend in natural regeneration Percentage of functional cover	80% survival rate for planted trees and shrubs at 10 years Increasing trend in native vegetation cover annually throughout the monitoring period Increasing trend in crown closure and vegetation cover throughout the monitoring year (approaching those of the reference sites)
	Width of the riparian zone	Provision of a 10 m to 20 m wide, vegetated, riparian zone
	Riparian habitat functionality	Confirmation that the types of vegetation planted are meeting potential to provide riparian habitat function based on field surveys
Fish habitat use	Salmon presence Fish species relative abundance	Presence of juvenile salmon by year two of monitoring Fish species abundance comparable to reference sites (+/- 20%)
Water quality	Temperature	Water temperature comparable to reference sites (+/- 20%)
Physical (structural) stability	Slope failure or movement of habitat complexing materials	No slope failure of significant movement of habitat complexing materials between sampling events
Hydraulic connectivity	Surface water connectivity of created habitat	Appropriate access / egress to and from the offsets is demonstrable

## 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 Aboriginal Groups. In BC, wetlands designated as ecologically important to a region are defined by Environment Canada as:

- 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); and
- All eelgrass (*Zostera* subspecies) beds.

Wetlands occupy approximately 90 ha 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 *Fisheries Act Authorization (15-HPAC-00585)* 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. During the reporting year, construction activities did not impact intertidal habitats or identified wetlands.

### 7.1. Wetland Protection Mitigations

LNG Canada commits to a number of 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:

- 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; and
- 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 for the purpose of 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.

The LNG Canada *Invasive Plant Management Plan* outlines requirements to reduce the potential spread of invasive plants at the Project site. Mitigations that are implemented during construction help to protect the integrity of wetlands on and adjacent to the Project site, and include, but are not limited to:

- Removal of invasive plants that are discovered as per the Weeds BC Profiles and ensuring all invasive plant matter being transported for disposal is covered and secured;
- Use of aggregate and fill material that is clear of invasive plant matter and disposal of any plant matter that is found in aggregate or fill material;

- Ensuring all vehicles and equipment being transported offsite are free of invasive plants; and
- Herbicides are applied in compliance with all regulatory requirements and are only applied by individuals with appropriate training and certification.

The LNG Canada *Surface Water Management Plan* for Construction describes mitigation measures put in place for management of surface water to protect wetlands and vegetation on and adjacent to the Project site. Where feasible, detention ponds and other runoff management technologies are implemented. Erosion and sediment controls put in place during construction activities are outlined in Section 2.3.2 of this report.

## 7.2. Wetland Compensation Plan

LNG Canada has developed a *Wetland Compensation Plan* in consultation with EAO, Environment Canada (EC), Aboriginal 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 within 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 local land conservation opportunities may be sought.

The Wetland Compensation Plan includes the following components:

- Implementation of marine fish habitat offsetting outlined in DFO *Fisheries Act Authorization (15-HPAC-00585)* for intertidal habitats that will establish 17 ha of estuarine wetlands within the Kitimat River Estuary with similar habitat function to the estuarine marsh habitat function in the Project footprint;
- In-lieu fees to an environmental NGO to deliver land securement and restoration, enhancement, and/or creation of 65 ha of wetlands;
- Environmental NGO development of a wetland monitoring program as part of their off-site wetland compensation program in accordance with the Wetland Compensation Plan and agreements with LNG Canada; and
- Incorporation of traditional use plants into compensation wetlands where appropriate and technically feasible and access to wetland compensation sites will be made available to Aboriginal Groups for the purposes of gathering traditional use plants wherever possible.

The *Wetland Compensation Plan* provides an evaluation of wetland functions associated with potentially affected wetlands. Methods of assessing wetland function followed guidance contained in a number of recognized standards, including but not limited to the Washington State Department of Ecology adapted processes. Hydrologic, biogeochemical, and habitat functions of wetlands were determined from literature review, project mapping, and field studies. Many indicators of a wetlands' potential to provide particular functions were derived from wetland mapping, based on the defining characteristics of wetland classes or site associations.

Field surveys, conducted by wildlife ecologists during baseline studies, determined the presence and abundance of wetland associated wildlife throughout 2013 and 2014. This information supports wildlife habitat suitability ratings that inform suitability models. Field studies included:

- Breeding bird fixed-radius point count surveys for songbirds;
- Raptor and wetland bird call playback surveys and raptor nest surveys;
- Marbled murrelet surveys and habitat assessments;
- Amphibian transect and intensive site surveys in wetland and riparian areas in conjunction with breeding bird surveys;
- Large mammal transect surveys; and
- Incidental observations of wildlife or wildlife indicators, important habitat features (e.g. wildlife trees), and wildlife movement corridors.

Wetland compensation measures have been identified in consultation with EC/Canadian Wildlife Services (CWS) and members of the PCJV. Consultation with potentially affected Aboriginal groups, specifically Haisla Nation, and local environmental NGO was conducted and will continue until wetland compensation is implemented. Consultation specific to wetland compensation occurred during public consultation in November 2014 and Haisla consultation in April 2015. Consultation with FLNRO has occurred through meetings in July 2015. Continued consultation with the ministry will occur until implementation.

During the reporting year, specific locations for wetland compensation continued to be assessed. When the final locations have been confirmed, LNG Canada will define how access will be provided to Aboriginal people.

### **7.2.1. Implementation and monitoring**

The *Wetland Compensation Plan* will be implemented 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 the same manner as the compensation for the lost wetland functions outlined in the *Wetland Compensation Plan*.

The environmental NGO wetland compensation delivery agent 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 through consultation with EC and CWS, but will include:

- Compliance monitoring to ensure compensatory habitats are constructed 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
- Adaptive management actions to promote long term performance of habitat.

Monitoring will occur in year one, and in years three, five, and 10 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 construction activities.

QEPs, including an avian biologist, are on site or available to support LNG Canada and provide guidance on avoiding harm. Mitigations to avoid impact to migratory birds include, but are not limited to:

- 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; and
- Adherence to provincial and federal setback distances for migratory bird and raptor nests.

During the reporting year, LNG Canada undertook tree clearing activities in the Cedar Valley Lodge construction area in accordance with the mitigations outlined above.

### 8.1. Noise and Light Management

No flaring or venting took place during the reporting year. All construction activities that took place were in compliance with the LNG Canada *Noise Management Plan* and the LNG Canada *Light Management Plan*, which define mitigations to minimize noise and light during implementation of the Project.

### 8.2. Timing Restrictions and Buffer Zones

On an annual basis, commencing March 25<sup>th</sup> through August 15<sup>th</sup>, LNG Canada will implement mitigations to reduce impact to migratory bird breeding and nesting habits. From January 1<sup>st</sup> through September 5<sup>th</sup> 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 take into account the disturbance level and nesting potential.

**A. Determine disturbance level of project activities.**

Activity	Disturbance Level
Traversing	I
Limbing, soil salvage, or site preparation that removes some vegetation	II
Brushing, hand falling, mechanical falling, mowing, mulching	III

**B. Determine nesting potential.**

Environment Canada Calendar Colour	Percentage of Species Nesting	Nesting Potential
Grey • White • Yellow	0-10%	Low
Light Orange	11-20%	Moderate
Dark Orange	21-40%	High
Red • Dark Red	41-100%	Very High

**C. Use Mitigation Matrix to determine mitigation level.**

Disturbance Level	Nesting Potential			
	Low	Moderate	High	Very High
I	1	1	1	1
II	1	2	3	3
III	1	3	4	5

During tree clearing efforts in the Cedar Valley Lodge construction area, LNG Canada has undertaken bird surveys to ensure that no potentially active nests are present within the active construction area. Bird surveys are conducted by a 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 prepares a report on bird survey results daily for LNG Canada, which includes a map of identified buffer zones. Construction progress and related active nests and buffer zones are tracked on a daily basis.

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.

Migratory bird data will be summarized at the end of the bird window and submitted to regulatory agencies as required. Within the reporting year, 8 bird surveys were completed and no bird nests were found.

### **8.3. Monitoring**

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.

### **8.4. Osprey**

No construction in the marine environment took place during the reporting year. The CEEA Implementation Plan was resubmitted to reflect changes in the start date of proposed marine activities from January 1, 2016 to January 1, 2017.

Under FLNRO *Permit SM15-178791*, LNG Canada undertook efforts to relocate an inactive Osprey nest from a light standard at the RT wharf to an area further from the construction footprint. The primary goal is to encourage the resident breeding pair of Osprey to relocate, build/refurbish a nest at an alternate constructed site, and to successfully breed at the new location, without any project-related disturbances to future breeding events.

The Osprey nest was removed from the wharf and a new platform was constructed in December of 2015. The nesting material from the old nest location was installed on the new platform in early January of 2016.

## **8.5. Marbled Murrelet**

Marbled Murrelet surveys were completed for the LNG Canada Project site in 2014. 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 high intensity nest survey will be undertaken as described in Section 8.2 of this report.

During the reporting year, LNG Canada did not disturb potential or high and moderate suitable marbled murrelet habitat.

## 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 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; and
- 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).

### 9.1. Noise Complaints

As outlined in Section 4.7 of this report, the LNG Canada Community Feedback Process was developed in consultation with Aboriginal Groups and key stakeholders to track inquiries and complaints related to community concerns, including noise. The Community Feedback Process acknowledges all complaints within 24 hours, with a response provided within two days.

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

### 9.2. Marine Water and Sediment Quality

No construction in the marine environment took place during the reporting year. The CEEA Implementation Plan was resubmitted to reflect changes in the start date of proposed marine activities from January 1, 2016 to January 1, 2017.

The LNG Canada MAP is under development, and will define requirements and mitigations for marine work. It will include 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 MAP will identify mitigation measures to avoid such exceedances and reference notification protocols for any exceedances that do take place.

The MAP will identify mitigation measures to minimize sediment dispersion during in-water construction activities, such as the installation of sheet pile wall.

Sediment and water quality monitoring will be implemented during in-water construction activities, and will include re-suspension and bioavailability of polycyclic aromatic hydrocarbons, dioxins and furans.

To support future dredging activities, in February 2015 a shellfish and groundfish tissue baseline study was completed. The results of the baseline study informed a human health risk assessment for the consumption of fish, which was completed in April 2015. Results of the shellfish and groundfish tissue baseline study were presented to EAO, MOE, and the British Columbia Ministry of Health (MOH) in April 2015.

A post-dredging follow-up program will be developed in consultation with Aboriginal groups in order to confirm the human health risk assessment predictions.

## 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. No construction took place in the vicinity of known archaeological sites in the reporting year.

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).

### 10.1. Archaeological and Heritage Resources Management Plan

LNG Canada has developed an Archaeological and Heritage Resources Management Plan in consultation with Aboriginal Groups. The Archaeological and Heritage Resources Management Plan takes into account 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 Aboriginal Groups will be notified as directed by the professional archaeologist.

No chance find events took place within the reporting year.

## **10.2. Marine Resources**

No construction activity took place within the marine environment during the reporting year.

To define procedures and practices for sharing information and facilitating communication with Aboriginal Groups and other local marine users, a communication protocol will be developed by LNG Canada prior to implementation of work in the marine environment. The communication protocol will include processes for communicating:

- Location and timing of construction activities in the marine environment and location and timing of traditional activities by Aboriginal 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; and
- Methods of providing feedback to LNG Canada on adverse effects related to navigation.

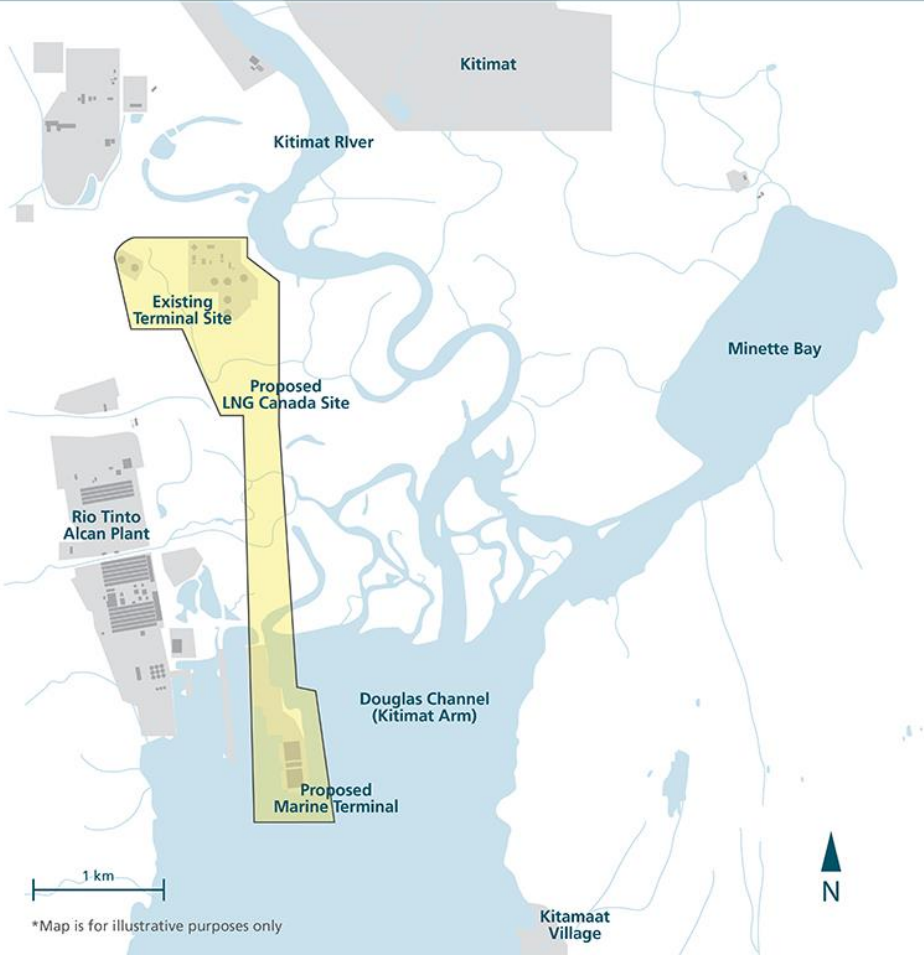
LNG Canada will also ensure that predictions made related to marine wake are accurate by developing a monitoring program to be implemented throughout the first two years of operation.

# **APPENDIX I:**

## **LNG Canada Site Map**



**Proposed LNG Canada site map**



# **APPENDIX II:**

## **LNG Canada Project Rendering**



1. LNG Processing Units will allow natural gas to enter into a train where carbon dioxide, water, condensate, sulphur and any impurities are separated out. The natural gas is chilled to approximately -161 degrees Celsius to form LNG.
2. The LNG will be piped to storage tanks and, when required, two loading lines will transfer LNG from the storage tanks to the wharf and the LNG carrier. They will be insulated to conserve energy and to keep the LNG in its liquid form.
3. The existing wharf will be redesigned to accommodate up to two LNG carriers at a time. Every LNG carrier will be assisted at the terminal by four tugboats to ensure a safe berthing. The existing rail yard will be used to load condensate.
4. The facility will draw water from the Kitimat River for use in process cooling, drinking and other purposes. Water taken from the river will be treated as needed prior to use. Water will be reused in a closed loop system to reduce water loss. Most of the water used by the cooling system will evaporate during use. Water that does not evaporate will be treated, along with any other facility wastewater, in an on-site wastewater treatment facility before releasing it into Kitimat Arm.
5. Two flare stacks will act as safety devices, a common feature in all LNG facilities. When the facility is operating normally, residents can expect to see a relatively small clean burning flame (essentially, a pilot light) at the top of the stacks. The size of this pilot light will be approximately three feet in height, and will likely not be visible during the day.

# APPENDIX III

## LNG Canada Project CEAA Implementation Schedule

**LNG Canada Development Inc.**

Shell Centre – 32<sup>nd</sup> Floor  
400 – 4<sup>th</sup> Avenue SW  
PO Box 100, Station M  
Calgary AB T2P 2H5  
Canada

April 20, 2016

Submitted electronically to: [compliance.conformite@ceaa-acee.gc.ca](mailto:compliance.conformite@ceaa-acee.gc.ca)

Canadian Environmental Assessment Agency  
22<sup>nd</sup> Floor, Place Bell  
160 Elgin Street, Ottawa  
ON K1A 0H3, Canada

To Whom It May Concern,

**Re: LNG Canada Development Inc. (“LNG Canada”) Export Terminal Project, Decision Statement, Issued under Section 54 of the Canadian Environmental Assessment Act, 2012 - Condition #11.3 Revised Implementation Schedule**

Condition #11.3 to Decision Statement:

*“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.”*

Therefore, please find enclosed the LNG Canada Revised Implementation Schedule. Updated information is related to marine work and is highlighted in yellow to facilitate review.

We trust you will find the attached satisfactory. If you have any questions or concerns, please do not hesitate to contact the writer.

Yours sincerely,

<Original signed by>

**Michael Lampp**  
Environment Lead  
LNG Canada Development Inc.

LNG Canada Export Terminal Project: Implementation Schedule – Prior to Construction

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
2.1	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.	1-Aug-14	End of all phases of Project	Condition is understood and has applied to front end engineering design (FEED) and will continue to apply to all phases of the Project
2.2	2.2 The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement: 2.2.1: provide written notice of the opportunity for the party or parties to present their views on the subject of the consultation; 2.2.2: provide sufficient information and a reasonable period of time to permit the party or parties to prepare their views; 2.2.3: provide a full and impartial consideration of any views presented; and 2.2.4: advise the party or parties that have provided comments on how the views and information received have been considered.	17-Jun-15	End of all phases of Project	Condition is understood and relevant for duration of the project. LNG Canada has continued to consult with Aboriginal groups on conditions and related topics since the Decision Statement was issued by CEAA, based on established relationships and methods of communication.
2.3	2.3: 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.	17-Jun-15	End of all phases of Project	LNG Canada has continued to consult with Aboriginal groups on conditions and related topics since the Decision Statement was issued by CEAA, based on established relationships and methods of communication. To confirm approach is still appropriate, LNG Canada sent letter to Aboriginal Groups on September 15, 2015 along with this Implementation Schedule.

LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
2.4	<p>2.4: The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement:</p> <p>2.4.1: 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);</p> <p>2.4.2: 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</p> <p>2.4.3: implement additional mitigation measures, as appropriate.</p>	17-Jun-15	End of all phases of Project	<p>LNG Canada has developed Environmental Management Plans (EMP) as required by EAO conditions. The EMP's outline the requirements for monitoring and implementation of mitigations stated or additional mitigations as required to manage environmental effects. The project monitoring programs will inherently verify the accuracy of the environmental assessment and describe the process for mitigating any additional effects identified during the monitoring of the various environmental aspects.</p>
2.5	<p>2.5: 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:</p> <p>2.5.1: implementation activities undertaken in the reporting year for each of the conditions;</p> <p>2.5.2: 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;</p> <p>2.5.3: 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;</p> <p>2.5.4: the results of the follow-up program requirements identified in conditions 3.14 , 4.2.4, 4.5, 5.3, 6.3.6 and 7.2; and</p> <p>2.5.5: any additional mitigation measures implemented or proposed to be implemented, as determined under condition 2.4.</p>	1-Jan-16	End of all phases of Project	<p>Condition is understood and is relevant for duration of project. The 2015 report will report construction activity from October - December 2015.</p>

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
2.6	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.	15-Oct-15	12 months prior to decommissioning activities commencing	Condition is understood and documents will be published on the LNG Canada website following submission of these documents to the parties referenced in the respective conditions.
2.7	2.7: 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.	As required	End of all phases of Project	Condition is understood and is relevant for duration of project
2.8	2.8: 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.	As required	End of all phases of Project	Condition is understood and is relevant for duration of project
3.1	The Proponent shall implement erosion control measures and sediment control measures during all phases of the Designated Project.	15-Oct-15	End of all phases of Project	Condition is understood and is relevant for duration of project
3.2	The Proponent shall revegetate disturbed riparian areas, using native vegetation, as soon as practicable after construction.	15-Oct-15	End of all phases of Project	Condition is understood and condition requirements are reflected in Vegetation Management Plan.



*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
3.3	The Proponent shall isolate construction activities from adjacent freshwater fish habitat.	15-Oct-15	End of construction phase	Condition is understood and condition requirements are reflected in the Fish Habitat Management Plan.
3.4	The Proponent shall salvage and relocate fish during in-water work requiring isolation of freshwater fish habitat.	15-Oct-15	End of construction phase	Condition is understood and condition requirements are reflected in the Fish Habitat Management Plan.
3.5	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.	Jul-14	End of operational phase	Condition is understood and is relevant for duration of project
3.6	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.	01-Jan-17	End of construction phase	Condition is understood and will be implemented during marine construction.

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
3.7	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.	15-Oct-15	End of construction phase	LNG Canada has shared its Construction Environmental Management Plan with Aboriginal Groups, which contained information about timing windows for in-water construction. LNG Canada engaged in discussions with those First Nations that provided comments on the CEMP, and is committed to ongoing engagement should there be further questions or concerns. Condition requirements are reflected in the Fish Habitat Management Plan and Marine Mammal Management Plan that was / is being developed in consultation with First Nations and DFO.
3.8	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.	15-Oct-15	End of construction phase	Condition is understood and is relevant for duration of construction phase of project

LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
3.9	<p>To avoid detrimental behavioural 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:</p> <p>3.9.1 identify the construction activities that generate underwater noise levels greater than 160 decibels and the periods of time when those activities will occur;</p> <p>3.9.2 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;</p> <p>3.9.3 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;</p> <p>3.9.4 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</p> <p>3.9.5 specify mitigation measures, such as sound dampening technology and soft-start procedures to reduce construction noise levels in the exclusion zone.</p>	1-Jan-17	End of Marine construction phase	Condition is understood and is relevant for duration of marine works on project
3.10	<p>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.</p>	On or about 2021	On or about 2046	Only when the facility is operational will LNG carriers transit the proposed marine route.

LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
3.11	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.	25-Jun-14	2021	Started consultation with DFO in June 2014 and continue to work with on finalizing a fish and fish habitat compensation plan. Implementation and monitoring of constructed offset habitat to follow (2016-2021).
3.12	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: 3.12.1 on migratory birds and their habitats; 3.12.2 on terrestrial species, including amphibians and reptiles, and their habitats; 3.12.3 on species at risk and their habitat; 3.12.4 on the current use of lands and resources for traditional purposes by Aboriginal peoples; 3.12.5 on navigation; and 3.12.6 from potential sources of contamination including polycyclic aromatic hydrocarbons, dioxins, furans, copper and zinc on the receiving environment.	5-Aug-15	24-Aug-15	Document sent to Compliance.conformite@ceaa-acee.gc.ca titled mem_fed_3_12_offsetting_effects_20150811.
3.13	The Proponent shall, if there are adverse effects on any of the elements of condition 3.12, avoid or lessen those adverse effects.	5-Aug-15	End of construction of offsetting habitat	As noted in condition 3.12

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
3.14	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.	15-Oct-15	End of all phases of Project	LNG Canada has shared various plans to address conditions 3.1 to 3.11 with Aboriginal Groups, as part of the EAO Working Group (included DFO) and through ongoing consultation. LNG Canada engaged in discussions with those First Nations that provided comments on plans received, and is committed to ongoing engagement should there be further questions or concerns. The EMP's outline the requirements for monitoring and implementation of mitigations stated or additional mitigations as required to manage environmental effects. The project monitoring programs will inherently verify the accuracy of the environmental assessment and describe the process for mitigating any additional effects identified during the monitoring of the various environmental aspects.
3.15	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.	15-Oct-15	End of all phases of Project	Condition is understood and is relevant for duration of project

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
4.1	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.	15-Oct-15	End of construction phase	Condition is understood and is relevant for duration of construction phase of project
4.2	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: 4.2.1 delineate clearing boundaries prior to the commencement of construction and respect those boundaries during construction; 4.2.2 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; 4.2.3 manage surface water and avoid erosion or sedimentation to maintain hydrology of adjacent wetlands and protect water quality; and 4.2.4 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.	15-Oct-15	End of construction phase	Condition is understood and is relevant for duration of construction phase of project

LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
4.3	<p>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:</p> <p>4.3.1 implementing a 2:1 ratio of compensation area to the loss of ecologically important wetland area;</p> <p>4.3.2 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;</p> <p>4.3.3 a preference for wetland restoration over enhancement, and wetland enhancement over creation; and</p> <p>4.3.4 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.</p>	27-Jul-15	Oct-15	<p>LNG Canada's draft Wetland Compensation Plan was shared with Aboriginal Groups as part of the EAO's Working Group (included DFO). LNG Canada has engaged in discussions with those First Nations that provided comments on the plan, and is committed to ongoing engagement should there be further questions or concerns. The Wetland Compensation Plan will be submitted to EAO 30 days prior to construction commencing.</p>
4.4	<p>The Proponent shall implement the wetland compensation plan within five years of the date of the start of construction.</p>	2016	2027	<p>Condition is understood. It is noted that monitoring is required post completion of offsetting habitat construction.</p>
4.5	<p>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.</p>	2019	2027	<p>Condition is understood.</p>

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
5.1	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.	15-Oct-15	End of construction phase	Condition is understood and condition requirements are reflected in the Wildlife Management Plan.
5.2	The Proponent shall: 5.2.1: restrict flaring of vented emissions to the minimum required for maintenance activities or to manage emergencies; 5.2.2: minimize flaring during night time and during periods of bird vulnerability; and 5.2.3: adjust operational lighting to avoid attracting migratory birds.	2021	End of operational phase	Condition is understood and is relevant for duration of project
5.3	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.	4-Oct-15	End of construction phase	Condition is understood and condition requirements are reflected in the Wildlife Management Plan.



*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
6.1	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: 6.1.1. complying with the Waste Discharge Regulation under British Columbia's Environmental Management Act for operational air emissions; 6.1.2. applying best management practices and guidance for construction noise from the British Columbia Oil and Gas Commission's Noise Control Best Practices Guidelines; and 6.1.3. complying with the operational noise requirement of the British Columbia Oil and Gas Commission's Liquefied Natural Gas Facility Regulation.	6.1.1.: 2021  6.1.2.:15-Oct-15  6.1.3.: 2021	End of all phases of Project	Condition is understood.  6.1.2.- Condition requirements are reflected in the Construction Noise Management Plan.
6.2	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.	17-Jun-15	End of all phases of Project	LNG Canada has developed a Community Feedback and Grievance Procedure, and it is referenced in the draft Community Level Infrastructure Services Management Plan (CLISMP) which has been shared with Aboriginal Groups. A revised version will be shared in September with a request for specific feedback on procedure.

LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
6.3	<p>The Proponent shall implement measures related to marine water quality and sediment quality, including:</p> <p>6.3.1: 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;</p> <p>6.3.2: 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;</p> <p>6.3.3: implementing mitigation measures to minimize sediment dispersion during in-water construction activities, including isolation methods;</p> <p>6.3.4: 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;</p> <p>6.3.5: 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; and</p> <p>6.3.6: 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.</p>	<p>6.3.1.- May 2015</p> <p>6.3.2.- Mar 2015</p> <p>6.3.3.-6.3.6.- 1-Jan-17</p>	<p>End of Marine construction phase</p>	<p>6.3.1 – a baseline shellfish and ground shellfish tissue assessment was completed in May 2015, the results will inform a human health risk assessment to be completed prior to marine construction activities in 2017</p> <p>6.3.2 - Reported out on program Fall of 2014 with additional modeling being completed in March 2015.</p> <p>Condition is understood and condition requirements are reflected in the Marine Water Quality Management and Monitoring Plan.</p>

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
6.4	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.	2021	2046	Condition is understood and is relevant for duration of operational phase.
7.1	7.1: 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: 7.1.1: location and timing of Designated Project-related construction activities; 7.1.2: location and timing of traditional activities by Aboriginal groups; 7.1.3: safety procedures, such as navigation aids and updated navigational charts; 7.1.4: location of areas where navigation is restricted for safety reasons; 7.1.5: 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; and 7.1.6: ways in which to provide feedback to the Proponent on adverse effects related to navigation experienced by Aboriginal groups and other local marine users.	1-Jan-17	End of all phases of Project	Condition is understood and will be addressed as part of the Marine Activities Plan.

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
7.2	7.2: 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: 7.2.1: 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 7.2.3: providing the results of the follow-up program and any corrective actions taken to Aboriginal groups.	2020	2023	Condition is understood and will be addressed as part Wake Verification Plan for operations.
7.3	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.	15-Sep-15	End of all phases of Project	A copy of this Implementation Schedule was provided to Aboriginal Groups on September 15, 2015.

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
8.1	<p>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 account British Columbia's Handbook for the Identification and Recording of Culturally Modified Trees. The Archaeological and Heritage Resources Management Plan shall include:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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</li> <li>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.</li> </ul>	10-Jun-15	15-Oct-15	<p>Condition is understood. LNG Canada has consulted on the Construction Environmental Management Plan (CEMP) with Aboriginal Groups, which contains the Archaeological and Heritage Resources Management Plan. LNG Canada engaged in discussions with those First Nations that provided comments on the CEMP, and is committed to ongoing engagement should there be further questions or concerns. LNG Canada site induction will include relevant sections of the Archaeological and Heritage Resources Management Plan.</p>

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
9.1	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;	2045	2045	Condition is understood and will be addressed with a Decommissioning Plan
10.1	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.	15-Oct-15	End of all phases of Project	Condition is understood and is relevant for duration of project.

LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
10.2	<p>In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall:</p> <p>10.2.1 notify relevant federal and provincial authorities, including the Agency of the occurrence as soon as possible;</p> <p>10.2.2 implement measures to minimize any adverse environmental effects associated with the occurrence as soon as possible;</p> <p>10.2.3 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:</p> <p>10.2.3 the measures that were taken to mitigate the effects of the occurrence;</p> <p>10.2.3 a description of any residual environmental effects, and any additional measures required to address residual environmental effects; and</p> <p>10.2.3 if an emergency response plan was implemented, details concerning its implementation.</p> <p>10.2.4 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.</p>	As required	End of all phases of Project	Condition is understood and requirements will be included in the site Emergency Response Plan for all phases of the project.
10.3	<p>The Proponent shall prepare and implement a communication strategy in consultation with Aboriginal groups that shall include:</p> <p>10.3.1 the types of accident or malfunction requiring a notification to the respective Aboriginal groups;</p> <p>10.3.2 the manner by which Aboriginal groups shall be notified of an accident or malfunction and of any opportunities to assist in the response; and</p> <p>10.3.3 points of contact for the Proponent and for the respective Aboriginal groups.</p>	15-Oct-15	End of all phases of Project	Condition is understood and requirements will be included in the site Emergency Response Plan for all phases of the project.

*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

<b>CEAA #</b>	<b>Condition</b>	<b>Commence Date</b>	<b>Completion Date</b>	<b>Relevant Notes</b>
11.1	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.	15-Sep-15	15-Sep-15	Letter sent on 15 September, 2015 to Compliance email by Robert St. Jean - re: LNG Canada Development Inc. ("LNG Canada") Export Terminal Project, Decision Statement, Issued under Section 54 of the Canadian Environmental Assessment Act, 2012 - Condition #11.1 Implementation Schedule
11.2	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.	2017	End of all phases of Project	Condition is understood and is relevant for duration of project
11.3	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.	As required	End of all phases of Project	Updated Implementation Schedule submitted 2016 Apr 20



*LNG Canada Export Terminal Project: Implementation Schedule Update 2016 April*

CEAA #	Condition	Commence Date	Completion Date	Relevant Notes
12	<p>12.1 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:</p> <p>12.1.1 the place, date and time of any sampling, as well as techniques, methods or procedures used;</p> <p>12.1.2 the dates and the analyses that were performed;</p> <p>12.1.3 the analytical techniques, methods or procedures used in the analyses;</p> <p>12.1.4 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</p> <p>12.1.5 the results of the analyses.</p>	1-Aug-15	End of all phases of Project	Use of Staketracker, SharePoint and Equis

## **APPENDIX IV:**

### **Monitoring and Reporting Summary Example: Surface Water Management**

## LNG Canada Surface Water Management Monitoring and Reporting Summary

Frequency	Requirements
Daily	<p>Work area inspections to ensure conformance with all EMP mitigation and management requirements and regulatory, approvals and permit requirements and shall document at a minimum:</p> <ul style="list-style-type: none"> <li>• General house keeping</li> <li>• ESC measures and effectiveness</li> <li>• Working near waterbody mitigation measures and discharge water quality parameters</li> <li>• Fish and wildlife protection measures</li> <li>• Waste management (signage, placement, waste in correct areas, waste is secure)</li> <li>• Presence/absence of invasive plants</li> <li>• Dust mitigations (where applicable)</li> <li>• Integrity and working order of environmental mitigation structures and equipment</li> </ul> <p>The inspection shall also make note of the following:</p> <ul style="list-style-type: none"> <li>• Location and scope of work being undertaken or planned for day</li> <li>• Weather and environmental conditions, including evidence of surface water or groundwater pollution</li> <li>• Areas or activities that could present additional risk and associated mitigations</li> <li>• Corrective actions / continual improvement changes</li> </ul>
Weekly	<p>Weekly environmental inspection reports to summarize:</p> <ul style="list-style-type: none"> <li>• Site activities and related weather conditions</li> <li>• Inspections completed (including daily inspection forms), any major findings and/or deficiencies</li> <li>• Issues, incidents, non-conformances, non-compliances and related corrective actions</li> <li>• Sampling results (as applicable)</li> </ul>
Incident	<p>Immediate incident reporting must include:</p> <ul style="list-style-type: none"> <li>• Date, time and location of the incident;</li> <li>• Nature and details of the incident including safety issues, work being undertaken at the time of the incident and pertinent environmental and weather information;</li> <li>• Mitigations put in place including details of initial incident response (e.g. spill response, first aid, etc.)</li> <li>• Incident status (i.e. uncontrolled, resolved) and likely ongoing mitigation and management requirements and corrective actions</li> <li>• LNG Canada adheres to all stakeholder and regulatory reporting as outlined in the ERP.</li> </ul>
Prior to any water release	<p>Surface water quality testing must be undertaken prior to any release to ensure compliance with discharge requirements, including but not limited to:</p> <ul style="list-style-type: none"> <li>• Flow rate, temperature, conductivity</li> <li>• Hydrocarbons (where appropriate)</li> <li>• Turbidity, total suspended solids</li> </ul>

# **APPENDIX V:**

## **LNG Canada Aboriginal Consultation Plan**

# ABORIGINAL CONSULTATION PLAN



## LNG CANADA PROJECT

**DATE:**  
AUGUST 2013



## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b> .....	<b>3</b>
1.1	PROJECT OVERVIEW.....	3
1.2	PROPONENT INFORMATION.....	3
1.3	PURPOSE OF THIS DOCUMENT.....	4
<b>2.0</b>	<b>ABOUT THE PROJECT</b> .....	<b>7</b>
<b>3.0</b>	<b>FRAMEWORK FOR ABORIGINAL CONSULTATION</b> .....	<b>11</b>
3.1	LNG CANADA’S PRINCIPLES FOR ABORIGINAL ENGAGEMENT .....	11
3.2	REGULATORY FRAMEWORK.....	11
3.3	IDENTIFICATION OF ABORIGINAL GROUPS.....	12
3.4	SCOPE OF CONSULTATION .....	13
<b>4.0</b>	<b>PROPOSED ABORIGINAL CONSULTATION PLAN</b> .....	<b>15</b>
4.1	CONSULTATION OBJECTIVES.....	15
4.2	PROPOSED STAGES OF CONSULTATION.....	16
4.2.1	Initial Engagement.....	16
4.2.2	Pre-Application Phase Consultation .....	18
4.2.2.1	Traditional Use and Baseline Environmental Studies.....	19
4.2.3	Application Review Phase Consultation.....	22
4.2.4	Ongoing Engagement .....	26
<b>5.0</b>	<b>DOCUMENTATION AND REPORTING</b> .....	<b>27</b>
5.1	CONSULTATION DOCUMENTATION.....	27
5.2	REPORTING AND TRACKING ISSUES AND CONCERNS .....	27
5.3	ABORIGINAL CONSULTATION REPORTS.....	26
<b>6.0</b>	<b>SUMMARY</b> .....	<b>29</b>

**List of Figures**

Figure 1: Project Site Map.....7  
Figure 2: Project Shipping Route.....8

**List of Tables**

Table 1: Summary of Preliminary Interests and Issues .....18  
Table 2: Initial Engagement and Proposed Pre-Application Consultation Activities .....19  
Table 3: Proposed Application Review Phase Consultation Activities.....21  
Table 4: Additional Provincial Permitting Requirements .....23  
Table 5: Additional Federal Permitting Requirements .....23  
Table 6: Proposed Issues Tracking Table.....26

## 1.0 INTRODUCTION

### 1.1 Project Overview

LNG Canada Development Inc. (“**LNG Canada**”) on behalf of Shell Canada Energy (“**Shell**”), Diamond LNG Canada Ltd. (an affiliate of Mitsubishi Corporation [“**Mitsubishi**”]), Kogas Canada LNG Ltd. (an affiliate of Korea Gas Corporation [“**KOGAS**”]), and Phoenix Energy Holdings Limited (an affiliate of Petro-China Investment (Hong Kong) Limited [“**PetroChina**”]) (collectively “**the Project Owners**”) is proposing to construct and operate a natural gas liquefaction plant and related marine terminal facilities, for the export of liquefied natural gas (“**LNG**”). This project is called the LNG Canada Export Terminal Project (“**the Project**”).

The proposed Project will be located in the District of Kitimat, British Columbia (“**BC**”) and will consist of the following major components:

- a natural gas receiving and LNG production facility (“**LNG facility**”);
- a marine terminal (“**marine terminal**”) able to accommodate two LNG carriers;
- supporting infrastructure and facilities including power supply and handling, water supply and handling, and waste collection and treatment;
- temporary infrastructure and facilities (located outside of the facility site); and
- operation of LNG carriers and other supporting marine traffic along the marine access route.

The Project requires an environmental assessment (“**EA**”) under both the British Columbia *Environmental Assessment Act* (“**BCEAA**”) and the *Canadian Environmental Assessment Act, 2012* (“**CEAA 2012**”). LNG Canada filed a Project Description with the provincial and federal governments on March 21, 2013.

The Federal Minister of the Environment approved the British Columbia Environmental Assessment Office (“**EAO**”)’s request for substitution of the environmental assessment of the proposed Project on May 21, 2013.

### 1.2 Proponent Information

LNG Canada is a joint venture comprised of Shell, Mitsubishi, KOGAS and PetroChina. The Project Owners are leaders in the global LNG industry. Shell has been a global leader in natural gas



liquefaction since 1964, with nine LNG projects in operation and three under construction.

Mitsubishi is Japan's largest trading company and operates in 90 countries. It has been investing in LNG since 1969 and handles approximately one half of Japan's LNG imports. KOGAS has been South Korea's principal LNG provider since 1983. It currently operates three LNG import terminals in Korea and other terminals in Asia and Mexico. KOGAS is also a leader in storage and re-gasification technology. PetroChina is China's largest oil and gas producer and supplier. It initiated development of three LNG import projects in June 2004, with two starting operations in 2011. Shell is also working bilaterally with each of these parties on various other LNG projects globally. If approved, the EA certificate and operational permits for the Project will be held by LNG Canada, a corporation incorporated under the laws of British Columbia, on behalf of the Project Owners.

Social Performance is the term LNG Canada uses to describe how it manages impacts, both positive and negative, of its business on the communities and societies in which it operates. As part of its Social Performance objectives, LNG Canada is committed to building and maintaining relationships with aboriginal groups and stakeholders associated with its proposed project. The primary purpose of engagement is to inform and enhance decision-making with the objective of minimizing negative impacts and maximizing benefits of the project or operation, in a sustainable way.

### **1.3 Purpose of this Document**

LNG Canada's consultation and engagement with aboriginal groups for the Project will be guided by the principles outlined in this Aboriginal Consultation Plan, ongoing discussions with, and input from potentially impacted aboriginal groups, and additional input/guidance as may be provided by applicable federal and provincial agencies. Where appropriate, comments and feedback received from Aboriginal groups with respect to LNG Canada's proposed consultation process, including references to how Aboriginal group input was considered, will be incorporated into the final version of this Consultation Plan prior to submission to the EAO.

The primary purpose of this Consultation Plan is to describe the approach, methods and activities that LNG Canada is proposing to use to share Project-related information and seek input from Aboriginal groups on the proposed Project. This Consultation Plan has been developed to meet the consultation requirements as set out in Part G of the section 11 order, a procedural order issued by the EAO under section 11 of BCEAA. The section 11 order establishes the scope, procedures and methods of the EA and sets out the requirements for consultation activities and timing.

Pursuant to a section 11 order, proponents are delegated procedural aspects for consulting Aboriginal groups. As such, the following Aboriginal groups will be invited to participate in the regulatory consultation process for the proposed Project:

Consultation related to the facility and associated activities:

- Haisla Nation

Consultation related to shipping activities:

- Haisla Nation
- Gitga'at First Nation
- Gitxaala Nation
- Kitselas First Nation
- Kitsumkalum First Nation
- Lax Kw'alaams First Nation
- Metlakatla First Nation

Notification:

- Métis Nation British Columbia

The proposed LNG facility and associated activities are located in the traditional territory of the Haisla Nation. LNG carriers and supporting marine vessels travelling along the proposed shipping route will pass through areas in which the Gitga'at exercise Aboriginal rights, and adjacent to the Gitga'at community at Hartley Bay and will pass through areas in which the Gitxaala exercise Aboriginal rights and assert Aboriginal title, and near the Gitxaala community at Kitkatla. Furthermore, LNG Canada understands that the proposed shipping route may interact with areas where the Kitselas, Kitsumkalum, Lax Kw'alaams and Metlakatla First Nations have exercised Aboriginal rights.

The Consultation Plan sets a framework for undertaking consultation in a timely manner consistent with the established Project schedule. While this proposed Consultation Plan is a requirement under BCEAA, it has been developed based on LNG Canada's commitment to providing meaningful opportunities for Aboriginal groups to participate in the consultation process and provide input into the proposed Project. The scope and extent of consultation with each First Nation will vary with the scope of Aboriginal interests identified by them and the degree to which their respective interests may potentially be impacted by the proposed Project.

LNG Canada's vision is to work collaboratively with Aboriginal groups, the local community, non-governmental organizations, and local, provincial and national levels of government to achieve the Project, and deliver a project that offers a new source of competitively priced LNG to global markets, while providing benefits to Canada, British Columbia and its coastal region.

## **2.0 ABOUT THE PROJECT**

The proposed Project will consist of the following major components, all located in the Province of British Columbia:

- a natural gas receiving and LNG production facility;
- a marine terminal able to accommodate two LNG carriers;
- supporting infrastructure and facilities including power supply and handling, water supply and handling, and waste collection and treatment;
- temporary infrastructure and facilities (located outside of the facility site); and
- operation of LNG carriers and other supporting marine traffic along the marine access route.

The natural gas will be delivered to the Project by a new third-party-owned and operated pipeline. It is anticipated that the Project will be constructed in two or three phases with the first phase having a design capacity of 12 million tonnes per annum (mtpa) of LNG and a further 12 mtpa of design capacity to be added in one or two subsequent phases. Construction of the first phase is expected to be completed in 2019/2020 and subsequent phase(s) will be developed as market demand requires.

The LNG facility will be located on approximately 300 – 350 hectares (ha) of fee simple property within the District of Kitimat. A schematic view of the proposed Project is shown in Figure 1.

Approximately 10% of the LNG facility site was previously developed for methanol production, storage, and transshipment (former Methanex Corporation facility), and for condensate transshipment (Cenovus Energy Inc.). The former Methanex site is now owned by Shell on behalf of the Project Owners.

The marine terminal will be located within the Port of Kitimat. The marine access route to the Port of Kitimat will start near the Triple Island Pilotage Station and continue south through Principe Sound, into Douglas Channel to the Kitimat Arm. At full build-out, the Project would expect between 170 and 350 carrier visits per year depending on the size of the LNG Carriers. The marine access route is illustrated in Figure 2. The proposed Project is expected to operate for a minimum of 25 years. At the end of the Project's operational life, the Project will be decommissioned pursuant to an approved decommissioning plan and conducted in accordance with the applicable regulations at the time.

The Project is anticipated to require additional permits, approvals, and authorizations from the Province of British Columbia, including the BC Oil and Gas Commission, the BC Ministry of Environment, the BC Ministry of Forests, Lands and Natural Resource Operations and others, following the issuance of an EA Certificate for construction and operation of the proposed Project. No federal financial support for the Project is proposed or anticipated, and no federal lands will be used for carrying out the Project. The Project may require additional permits, approvals and authorizations anticipated to be required from the Government of Canada for construction and operation of the Project, including the Department of Fisheries and Oceans, Transport Canada and Environment Canada, in addition to a federal EA decision from the Canadian Environmental Assessment Agency (“**CEA Agency**”).

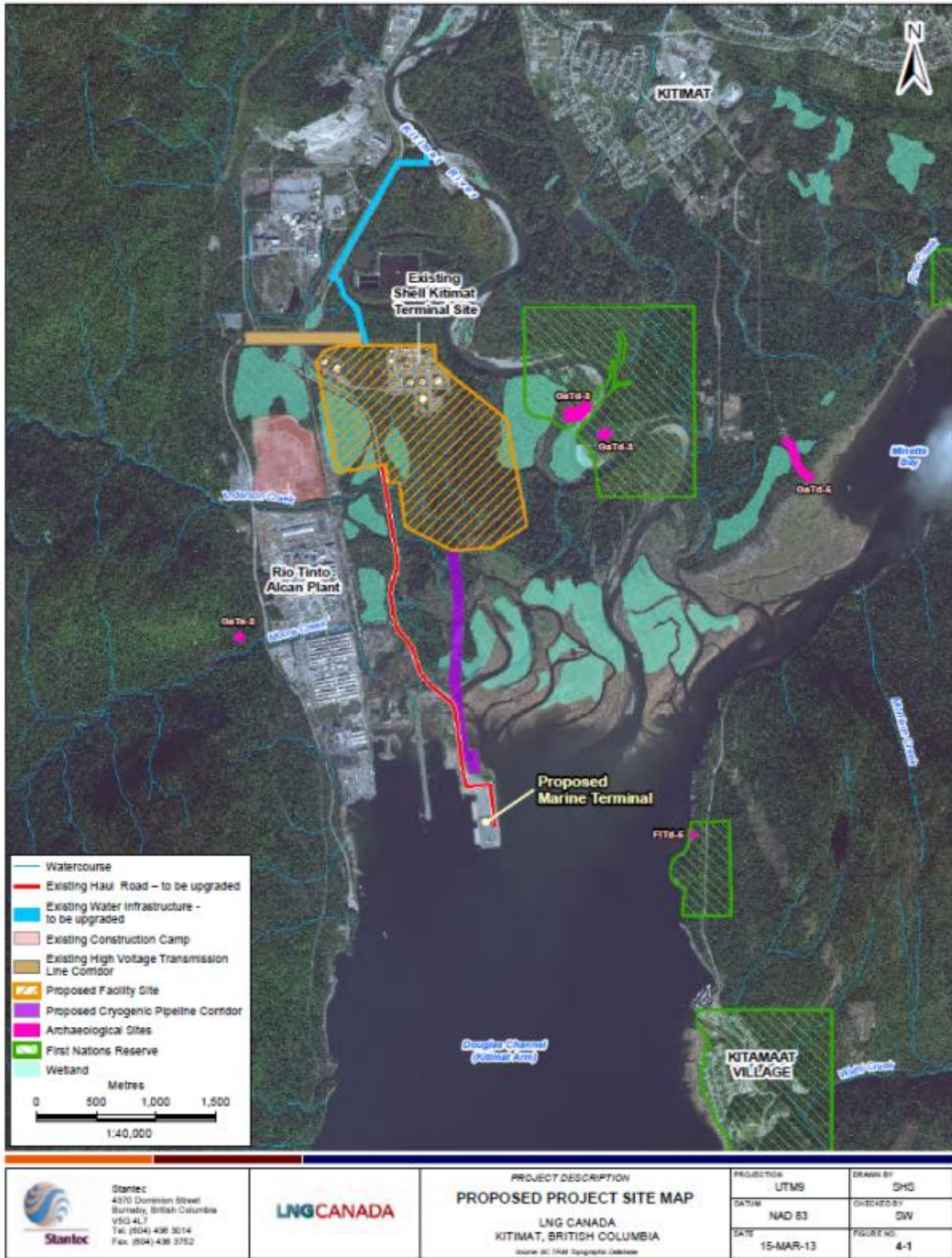


Figure 1: Project Site Map

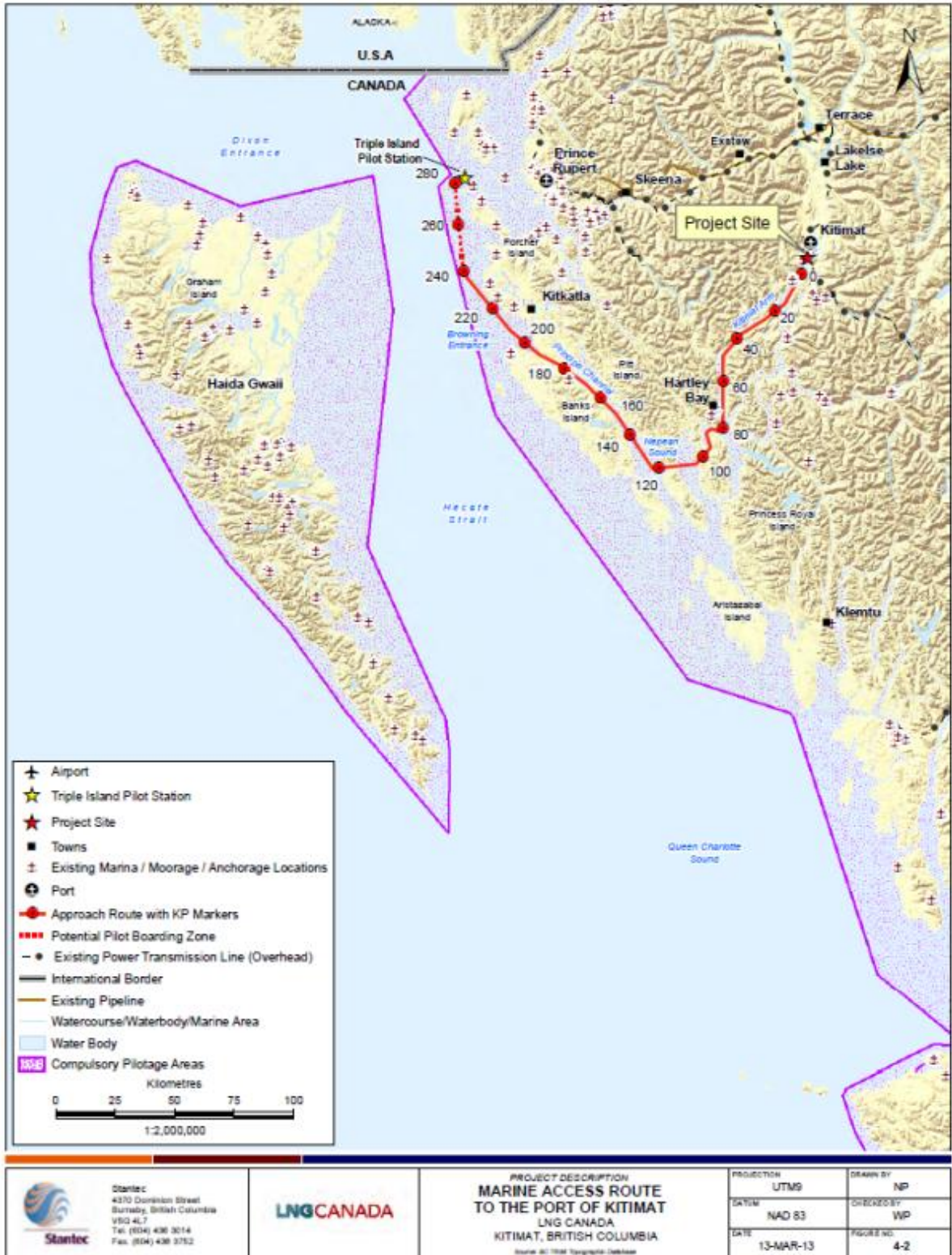


Figure 2: Project Shipping Route

### **3.0 FRAMEWORK FOR ABORIGINAL CONSULTATION**

#### **3.1 LNG Canada's Principles for Aboriginal Engagement**

LNG Canada recognizes the unique cultural, legal and historical identity of Aboriginal groups, and strives to engage with their communities in a respectful and appropriate manner. LNG Canada has developed a comprehensive consultation and engagement strategy based around the following principles:

**Shared Process** – LNG Canada's consultation program will be developed based on a shared process that seeks and considers input from Aboriginal groups.

**Respect** – LNG Canada respects Aboriginal groups' culture and values and is committed to developing relationships based on mutual respect and understanding.

**Timeliness** – LNG Canada is committed to undertaking early engagement with Aboriginal groups and to providing timely and accurate exchange of information about the proposed Project and opportunities to participate in consultation activities.

**Relationships** – LNG Canada will seek to establish and maintain long-term relationships with Aboriginal groups with an interest in the proposed Project. These relationships will evolve through ongoing engagement and participation in the Project.

**Responsiveness** – LNG Canada will work to understand, consider and respond to input from Aboriginal groups and provide feedback on how input has been considered in Project planning, including mitigation plans. Results from the consultation process will be compiled in Consultation Summary Reports.

**Open Communication** – LNG Canada will consult closely with Aboriginal groups with respect to the project and regulatory process. LNG Canada will openly gather and listen to feedback and work with Aboriginal groups to resolve concerns that might be identified, as required.

#### **3.2 Regulatory Framework**

The Project is a "reviewable project" under the Reviewable Projects Regulation pursuant to BCEAA, and is a "designated project" under the Regulations Designating Physical Activities pursuant to CEEA 2012.

The Government of British Columbia and the federal government have issued policy guidance setting out general principles for consultation with Aboriginal groups and details with respect to the



Crown's obligation to consider aboriginal interests in decision-making processes that could lead to impacts on the exercise of Aboriginal rights. In making its request for substitution, the EAO committed to fulfilling a number of conditions established by CEAA 2012, and the Federal Minister, for the purposes of substitution including among other conditions:

- conducting procedural aspects of Aboriginal consultation in accordance with the process set out in the Memorandum of Understanding; and
- making funding available to Aboriginal groups provided by the Canadian Environmental Assessment Agency to support Aboriginal consultation during the substituted EA

This Consultation Plan has been developed to meet LNG Canada's current understanding of the Aboriginal group consultation requirements of the EAO and CEA Agency as part of the EA of the Project.

The EAO's expectations with respect to a proponent's role in consultation are laid out in the Proponent Guide for Providing First Nations Consultation Information. There are two versions of this guide – one for Treaty First Nations and the other for Non-Treaty First Nations. The LNG Canada project is located in a non-treaty area. In the guide, the delegation process is described as:

*“Pursuant to the section 11 order, a proponent is assigned certain responsibilities related to procedural aspects of the Crown's duty to consult with potentially impacted First Nations. This includes responsibility to gather information about how the First Nations' asserted rights including title may be impacted by the proposed project and consideration of ways in which First Nations concerns and interests can be accommodated.”*

The EAO User Guide (updated in 2011) was also referenced by LNG Canada in preparation of this Consultation Plan.

### **3.3 Identification of Aboriginal Groups**

LNG Canada has undertaken a preliminary analysis of Aboriginal groups who may have interests potentially impacted by the proposed Project. Based on its review of available information and consistent with the section 11 order, LNG Canada has determined that the proposed Project and/or related activities lies within or in proximity to the asserted traditional territories, or areas where Aboriginal rights have been exercised by the following Aboriginal groups:

Consultation related to the facility and associated activities:

- Haisla Nation

Consultation related to shipping activities.

- Haisla Nation
- Gitga’at First Nation
- Gitxaala Nation
- Kitselas First Nation
- Kitsumkalum First Nation
- Lax Kw’alaams First Nation
- Metlakatla First Nation

Notification:

- Métis Nation British Columbia

The proposed LNG facility and associated activities are located in the traditional territory of the Haisla Nation. LNG carriers and supporting marine vessels travelling along the proposed shipping route will pass through areas where the Gitga’at have and continue to exercise Aboriginal rights and assert Aboriginal title and adjacent to the Gitga’at community at Hartley Bay and will pass through areas where Gitxaala have exercised Aboriginal rights and assert Aboriginal title and near the Gitxaala community at Kitkatla. Furthermore, LNG Canada understands that the proposed shipping route may interact with areas where the Kitselas, Kitsumkalum, Lax Kw’alaams and Metlakatla First Nations have exercised Aboriginal rights.

Pursuant to the federal conditions under the substituted EA process, the EAO will, as applicable, notify the Métis Nation British Columbia (MNBC) to provide information about the Project, on behalf of the Federal government to fulfill the obligations of CEAA. LNG Canada expects to engage with MNBC as directed in the section 11 order and through the broader consultation program for the proposed Project.

### **3.4 Scope of Consultation**

The scope and extent of consultation with each of the Aboriginal groups (identified above) will vary with the scope of Aboriginal interests identified by them and the degree to which their respective interests may potentially be impacted by the Project. LNG Canada will consult with potentially impacted Aboriginal groups as set out in the section 11 order throughout the course of the regulatory process to better understand how the proposed Project may potentially impact past or current Aboriginal practices, traditions and customs, and how measures may be incorporated into

the Project to avoid, mitigate or otherwise address those potential impacts. Additional guidance and input with respect to the scope of consultation may be provided by the EAO and/or CEA Agency.

## **4.0 PROPOSED ABORIGINAL CONSULTATION PLAN**

The Consultation Plan has been developed in accordance with LNG Canada's initial understanding of potentially impacted Aboriginal groups communities and their current and past uses of the proposed Project area. LNG Canada acknowledges that this understanding is based on publicly available information submitted by Aboriginal groups as part of recent similar large-scale EAs in the region, desktop research, preliminary discussions with Aboriginal groups and LNG Canada expertise and will need to be further developed and refined based on consultation with those Aboriginal groups. To that end, LNG Canada will seek feedback from Aboriginal groups on the proposed consultation approach, timing and methods of consultation and provide opportunities for Aboriginal groups to support the definition of key consultation milestones, and review the accuracy with which their interests and issues have been characterized to date.

### **4.1 Consultation Objectives**

The objectives of LNG Canada's proposed consultation process are to:

- Identify Aboriginal groups who may potentially be impacted by the proposed Project and through ongoing engagement, determine how they wish to be consulted;
- provide timely and reasonable levels of capacity resources to ensure that potentially-impacted Aboriginal groups have the opportunity to appropriately participate in Project consultation;
- provide timely and relevant information about the proposed Project and seek feedback from Aboriginal groups on their Project-related interests and concerns;
- understand Aboriginal groups' governance and community interests and priorities;
- determine what practices, traditions or customs have been, or are currently being engaged in by Aboriginal groups in the vicinity of, or in relation to the proposed Project;
- determine how these practices, traditions or customs may potentially be impacted by the proposed Project;
- collaboratively explore appropriate measures to avoid, mitigate or otherwise address potential Project impacts on identified and established aboriginal interests and rights and/or asserted aboriginal title;
- ensure that issues raised by Aboriginal groups related to the proposed Project are fully

considered in the development and implementation of the Project and that such issues are addressed, resolved or otherwise accommodated, as appropriate; and

- develop positive long-term relationships with Aboriginal groups.

LNG Canada will explore opportunities to provide direct benefits and support to the Aboriginal groups and communities potentially impacted by the Project, including consideration of local contracting, employment, training, capacity building and support for Project related initiatives of interest to the particular community.

## **4.2 Proposed Stages of Consultation**

LNG Canada is proposing a staged approach to consultation with Aboriginal groups designed to share Project information and seek input, and involve Aboriginal groups in the Project on an ongoing basis. Key consultation activities can be categorized based on the stage of Project development and the regulatory process, including:

- **Initial Engagement**, covering the time period from Project inception to the filing of the Project Description and the collection of baseline information;
- **Pre-Application Phase Consultation**, covering the time period from the filing of the Project Description, the issuance of the section 11 order, the development of the Application Information Requirements, the collection of baseline information and the filing of an Application for an Environmental Assessment Certificate (EAC) and any supporting permitting applications that may be submitted synchronously;
- **Application Review Phase Consultation**, covering the time period from the acceptance of the Application for an EAC by the EAO and including any supporting permitting applications that may be submitted synchronously, to the receipt of the EAO and/or federal decision on the Application for the EAC; and
- **Ongoing Engagement**, covering the time period from the receipt of the EAO and/or federal decision on the Application for the EAC, and including any continuing synchronous permitting applications or any subsequent permitting applications, through construction operations, and decommissioning of the proposed Project.

### **4.2.1 Initial Engagement**

Initial engagement with Aboriginal groups with respect to the proposed Project was focused around relationship building, sharing general information related to LNG and LNG shipping, and sharing

preliminary Project information. All Aboriginal groups listed in this Consultation Plan were first notified about the proposed Project in December 2011 through introductory letters to indicate site acquisition and an offer to meet to introduce the proposed Project.

As an early engagement initiative, LNG Canada also participated in and provided funding for an LNG workshop hosted by the CFN organization for its members and contributed funding for the CFN organization to undertake a marine study to look broadly at the risks and opportunities associated with LNG shipping.

Through 2012, LNG Canada advanced early discussions with the Haisla Nation, Gitga'at First Nation and Gitxaala Nation aimed at developing process and work plans for engagement and to support their involvement in the proposed Project. LNG Canada also sought preliminary feedback on opportunities to work collaboratively through training, employment and contracting as well as participation in baseline studies and environmental field work.

LNG Canada provided notification to all Aboriginal groups identified in this Consultation Plan of their intent to file the Project Description and offered an opportunity to meet to discuss the key elements of the proposed Project. An advanced copy of the Project Description was also provided for their review with an invitation to initiate more specific discussions with respect to the proposed Project and the potential impacts to their aboriginal interests. As the Project evolves, LNG Canada continues to work to engage all Aboriginal groups identified in this Consultation Plan to seek their input on how they wish to participate in the consultation process, engage in Project-related discussions, and identify preliminary interests and/or concerns with respect to the proposed Project.

As of June 2013, LNG Canada has defined a framework for consultation and engagement with the Haisla Nation, Gitga'at First Nation and the Gitxaala Nation by entering into protocol agreements and providing capacity funding to participate in the EA and regulatory processes. LNG Canada continues to advance discussions with Aboriginal groups identified in this Consultation Plan around developing a process for consultation and engagement through the regulatory review, as well as supporting their involvement in the proposed Project.

Based on early discussions, the following preliminary interests and/or concerns have been identified by Aboriginal groups:

**Table 1: Summary of Preliminary Interests and Issues**

<b>Category</b>	<b>Identification of Interests and Potential Issues</b>
<b>Facility</b> – includes potential impacts related to the proposed facility and marine terminal	Cumulative effects of industry growth
	Potential air quality and related effects
	Potential for increased strain on local services and infrastructure
	Potential for project benefits including economic, training, employment, and contracting opportunities
	Potential impact on the marine environment
	Potential impacts from construction activities
	Traditional and cultural heritage
	Upstream gas activity and Project design
<b>Shipping</b> – includes potential impacts related to shipping activities	Potential visual quality impacts
	Opportunities for project benefits including employment, contracting and economic benefits
	Potential impacts as a result of shipping activities, including potential for accidents and malfunctions
	Potential impacts from noise
	Potential impacts on air quality and related effects
	Potential impacts on the marine environment
	Potential impacts to local economy including fishing, aquaculture and tourism
	Potential impacts to subsistence and country foods
Traditional and cultural heritage	
Potential visual quality impacts	

LNG Canada acknowledges that the above noted interests have been identified by Aboriginal groups based on preliminary Project information. We are committed to working with Aboriginal groups through the regulatory review process and as more detailed Project information becomes available, to identify Aboriginal interests and potential adverse effects to those interests, and develop strategies to avoid, mitigate or otherwise accommodate those interests, where appropriate throughout subsequent stages of consultation.

#### **4.2.2 Pre-Application Phase Consultation**

LNG Canada proposes to meet regularly with potentially impacted Aboriginal groups to engage in meaningful consultation in support of the pre-Application phase of the regulatory review. In particular, during this phase of the consultation process, LNG Canada will develop and seek

feedback from Aboriginal groups on the proposed Consultation Plan and activities contemplated herein, work with Aboriginal groups through the development of the draft Application Information Requirements (AIR) as set out in the section 11 order, including seeking their feedback on the selection of Valued Components as appropriate, and work with Aboriginal groups through the regulatory framework to encourage their participation in regulatory activities such as the EAO Working Group.

The specific objectives for the Pre-Application stage of consultation are to:

- Develop and seek feedback from Aboriginal groups on the proposed Consultation Plan;
- Provide ongoing two-way communication and information sharing about the proposed Project and environmental assessment review to seek feedback on the selection of Valued Components and input to assist in developing the draft AIR;
- Incorporate relevant feedback into the draft AIR and provide details on how Aboriginal groups’ feedback was considered in finalizing the AIR;
- Provide opportunities for Aboriginal groups to participate in baseline studies and EA-related field work;
- Document and report additional concerns and comments through the consultation process regarding the proposed Project and where, if applicable, these have been incorporated into the proposed Project’s design; and
- Host open houses and meetings prior to the Application Review stage to provide updated Project information to facilitate participation in the Application Review stage.

Table 2 below provides an overview of the proposed consultation activities to be undertaken in advance of filing the Application for an EAC.

**Table 2: Initial Engagement and Proposed Pre-Application Consultation Activities**

Proposed Activity	Description	Anticipated Timing
<b>Develop Communications Tools and Materials</b>	LNG Canada will develop and maintain communications tools and materials to share project related information that Aboriginal groups can access publicly including: <ul style="list-style-type: none"> <li>• Project website</li> <li>• Project fact sheets</li> <li>• Project information line (1-855-248-3631)</li> </ul>	Ongoing



Proposed Activity	Description	Anticipated Timing
<b>Provide summary of proposed EA baseline study program</b>	LNG Canada will provide summaries and Terms of References where possible of proposed environmental baseline study programs to Aboriginal groups in the area to seek input with respect to the proposed methodology, timing, locations and nature of information collected to form the basis of the environmental assessment.	2013
<b>Provide advance copy of Project Description</b>	LNG Canada will provide an advance copy of the Project Description to Aboriginal groups.	Completed
<b>Develop and Review Proposed Consultation Plan</b>	LNG Canada will provide a draft of the proposed Consultation Plan to Aboriginal groups for review and comment to seek their input on the adequacy of the proposed consultation activities and the accuracy with which consultation has been characterized to date. Feedback received from Aboriginal groups will be incorporated into the final version of this Consultation Plan, as appropriate prior to submission to the EAO.	Current
<b>Ongoing Consultation Meetings</b>	<p>Ongoing meetings with Aboriginal group representatives, including consultants, or Chiefs and Councils as required throughout the Pre-Application phase of the EA process to:</p> <ul style="list-style-type: none"> <li>• share project related information and seek feedback from Aboriginal Groups related to their Aboriginal rights and interests;</li> <li>• seek to identify Aboriginal groups interests and potential issues related to the proposed Project;</li> <li>• develop mutually acceptable mitigation measures;</li> <li>• identify need for appropriate follow up strategies; and</li> <li>• identify the scope and nature of additional consultation.</li> </ul>	Ongoing
<b>Participation in baseline studies and EA-related field work</b>	LNG Canada will work with potentially impacted Aboriginal groups to identify opportunities to participate in baseline data collection, EA-related fieldwork and other contracting and employment opportunities that may become available, as appropriate. This may include but is not limited to consultation on permit applications required for baseline field work, participation in field work, or undertaking monitoring activities as appropriate, or as required by government agencies such as the Archaeology Branch.	2012, 2013
<b>Review of draft Application Information Requirements (AIR)</b>	<p>LNG Canada will participate in the EAO's Aboriginal group engagement and consult with Aboriginal groups in the review of the draft Application Information Requirements.</p> <p>LNG Canada will participate and provide materials to the EAO led Open House or Community Meetings as required for the review of the draft AIR.</p>	2013
<b>EA Working Group Meetings</b>	As set out in the section 11 order, LNG Canada will attend working group meetings as directed by the EAO.	At the direction of the EAO

Proposed Activity	Description	Anticipated Timing
<b>Aboriginal Consultation Report Review</b>	<p>LNG Canada will prepare Consultation Reports as required by the EAO and outlined in the section 11 order to:</p> <ul style="list-style-type: none"> <li>• summarize the consultation process;</li> <li>• identify feedback and information received during the consultation process;</li> <li>• identify potential adverse Project impacts on Aboriginal interests;</li> <li>• identify where and how potential adverse Project impacts have been avoided, mitigated, addressed or otherwise accommodated including changes to Project design or other mitigation measures; and</li> <li>• provide next steps as required.</li> </ul> <p>As identified in the section 11 order, the Consultation Reports summarizing this stage of consultation will be provided to the EAO at the following timelines:</p> <ul style="list-style-type: none"> <li>• within 30 days of the deadline for aboriginal and working group comments on the draft AIR; and</li> <li>• at the time of submission of the Application for an EAC.</li> </ul> <p>LNG Canada will provide draft copies of the Consultation Reports for review and comment by the respective Aboriginal groups prior to submission of the reports to the EAO.</p>	2013, 2014
<b>Preparation for Submission of the Application for an EAC</b>	<p>LNG Canada will provide relevant sections of the draft Application to Aboriginal groups for review and comment in advance of submitting the Application to the EAO. Feedback received from Aboriginal groups will be incorporated in to the final Application as appropriate.</p>	2014

#### **4.2.2.1 Traditional Use and Baseline Environmental Studies**

LNG Canada will consult with Aboriginal groups to discuss what measures may be undertaken to collect traditional use information with respect to their practices, customs and traditions in the vicinity of, or in relation to the proposed Project, in order to assess those potential Project impacts to the exercise of their Aboriginal rights and related interests. A key focus of discussions will be around identifying gaps in existing traditional use information that may have been gathered by Aboriginal groups, determining the best approach to address potential gaps in information gathered to-date, and ensuring that Aboriginal groups are adequately resourced to undertake additional research that may be required. This may include undertaking a Traditional Use Study (TUS) or other relevant cultural studies if none have been completed, or supplementing existing information through additional research. Irrespective of the method for gathering the information, the focus will

be around identifying areas of specific importance to Aboriginal groups relative to the Project's potential impacts on their Aboriginal rights and interests.

In addition to information collected on traditional uses, LNG Canada understands and acknowledges that Aboriginal groups are the holders of important traditional knowledge with respect to the species, lands and marine resources that make up the natural environment within their asserted traditional territory. This knowledge may be integrated into EA study components where available and feasible, to complement the scientific data being collected. To that end, LNG Canada will work collaboratively with Aboriginal groups to gather information that document their traditional uses, knowledge and interests within their territory relative to the proposed Project's potential impacts.

LNG Canada acknowledges that traditional use and knowledge information that may be provided by Aboriginal groups may contain confidential information. LNG Canada will discuss with Aboriginal groups how best to manage the use of sensitive information provided to LNG Canada in order to ensure that information identified as confidential can be used in regulatory materials in a manner that is reasonable and appropriately minimizes the full or actual disclosure of the confidential information. Confidential information may be used in developing avoidance and mitigation plans and environmental protection plans as outlined by agreements between LNG Canada and Aboriginal groups. Materials prepared by LNG Canada that will be submitted as part of the regulatory process may reference confidential information however; LNG Canada acknowledges the intellectual property rights and ownership of Aboriginal groups of any original source traditional use and knowledge data and information that may be provided by Aboriginal groups.

As part of the early collection of baseline data for the proposed Project, LNG Canada has made efforts to seek feedback from Aboriginal groups whose communities are located near the proposed LNG facility or directly adjacent to the shipping route. LNG Canada has provided information on proposed study programs, including the timing, methodology and locations of proposed baseline study work, where appropriate. Summaries of proposed studies for the collection of baseline data on underwater noise, marine mammals, air quality and noise have also been provided.

#### **4.2.3 Application Review Phase Consultation**

The primary purpose of this stage of the consultation process is to ensure that Aboriginal groups are provided with adequate opportunities to review and comment on the Application for an EAC. The objectives for the Application Review stage of consultation are as follows:

- Provide ongoing two-way communication and information sharing about the proposed Project and environmental assessment review;
- Seek Aboriginal groups feedback on LNG Canada’s Application for an EAC;
- Support Aboriginal groups involvement in EAO-led consultation activities including the Working Group and Open Houses;
- Track and respond to Aboriginal groups’ issues and concerns and demonstrate how input has been considered in refining Project designs and developing avoidance and mitigation measures;
- Refine appropriate mitigation measures and work to resolve outstanding issues with respect to Aboriginal interests, including asserted Aboriginal rights and/or title where appropriate; and
- Document consultation results and report additional concerns and comments regarding the proposed Project in a Consultation Summary Report;

A preliminary list of consultation activities contemplated to support the submission and review of the Application for an EAC are included in Table 3 below. As noted previously, these activities are to be further developed through ongoing consultation with Aboriginal groups.

**Table 3: Proposed Application Review Phase Consultation Activities**

Proposed Activity	Description	Anticipated Timing
<b>Ongoing Consultation Meetings during Application Review Phase</b>	Notification of submission of the Application for an EAC and ongoing meetings with Aboriginal groups’ representatives, Chiefs and Councils or communities as required through consultation with Aboriginal groups to: <ul style="list-style-type: none"> <li>• share and discuss the Application for an EAC;</li> <li>• refine appropriate mitigation measures;</li> <li>• work to resolve any outstanding issues;</li> <li>• identify need for appropriate follow up strategies; and</li> <li>• identify the scope and nature of additional consultation measures or related commitments that may be required.</li> </ul>	Ongoing through Application Review Phase
<b>EAO-led Application Review Phase Open House(s)</b>	LNG Canada will participate in public open house(s), led by the EAO as part of the EA review process, to provide information and seek feedback on the Project. Consistent with the requirements for notification, LNG Canada will ensure that Aboriginal groups are notified about opportunities to participate in public open house(s).	At the direction of the EAO

<b>Proposed Activity</b>	<b>Description</b>	<b>Anticipated Timing</b>
<b>Notification and Information Distribution</b>	<p>Additional means of notification and information sharing will be employed by LNG Canada in consultation with Aboriginal groups as appropriate. These may include:</p> <ul style="list-style-type: none"> <li>• newspaper and radio advertisements;</li> <li>• community posters;</li> <li>• letters of invitation to Aboriginal groups and other interested parties;</li> <li>• e-mail notification; and</li> <li>• website.</li> </ul>	
<b>EA Working Group Meetings</b>	As set out in the section 11 order, LNG Canada will attend working group meetings as directed by the EAO.	At the direction of the EAO
<b>Aboriginal Consultation Report Review</b>	<p>LNG Canada will prepare Consultation Reports as required by the EAO to:</p> <ul style="list-style-type: none"> <li>• summarize the consultation process;</li> <li>• identify feedback and information received during the application review phase;</li> <li>• identify potential adverse Project impacts on Aboriginal interests;</li> <li>• identify where and how potential adverse Project impacts have been avoided, mitigated, addressed or otherwise accommodated including changes to project design or other mitigation measures; and</li> <li>• provide next steps as required.</li> </ul> <p>As identified in the section 11 order, the Consultation Reports summarizing this stage of consultation will be provided to the EAO at the following timelines:</p> <ul style="list-style-type: none"> <li>• 120 days after the commencement of the Application Review stage; and</li> <li>• at any other time specified by the EAO.</li> </ul> <p>LNG Canada will provide draft copies of the Consultation Reports for review and comment by the respective Aboriginal groups prior to submission of the reports to the EAO.</p>	2014
<b>Ongoing Follow-up/liaison as required</b>	LNG Canada will ensure that Aboriginal groups are consulted and provided with timely Project information through ongoing follow up/liaison as required via telephone calls, letters and e-mails.	Ongoing as required

Additional permits, approvals, and authorizations are anticipated to be required from the Province following the issuance of an EA Certificate for construction and operation of the proposed Project. These are summarized in Table 4 below.

**Table 4: Additional Provincial Permitting Requirements**

<b>Permit Required</b>	<b>Governing Agency</b>	<b>Project Component</b>
<b>Construction Permits</b>		
Master License to Cut under the <i>Oil and Gas Activities Act</i>	BC Oil and Gas Commission	Pre-construction site clearings
LNG facility Permit under the <i>Oil and Gas Activities Act</i>	BC Oil and Gas Commission	Construction of the LNG facility
Water system construction permit under Section 7 of the <i>Drinking Water Protection Act</i>	BC Ministry of Health Services	Drinking water supply if municipal water not used
Water License under Section 8 of the <i>Water Act</i>	BC Oil and Gas Commission	Short-term water withdrawal from Kitimat River for hydrostatic testing of LNG tanks
<b>Operations Permits</b>		
LNG facility Permit under the <i>Oil and Gas Activities Act</i>	BC Oil and Gas Commission	Operation of the LNG facility
Waste Discharge Permit under the <i>Environmental Management Act</i>	BC Oil and Gas Commission/ BC Ministry of Environment	Air and water emissions
Water Licence under <i>Water Act</i>	BC Ministry of Forests, Lands and Natural Resource Operations (Resource Stewardship Division/Water Management Branch)	Water supply from Kitimat River for facility
Water system operation permit under Section 8 of the <i>Drinking Water Protection Act</i>	BC Ministry of Health Services	Drinking water supply if municipal water not used

Additional permits, approvals and authorizations are also anticipated to be required from Canada for construction and operation of the proposed Project. Additional federal permitting requirements are summarized in Table 5 below.

**Table 5: Additional Federal Permitting Requirements**

<b>Permit Required</b>	<b>Governing Agency</b>	<b>Project Component</b>
<i>Fisheries Act</i> Authorization	Fisheries and Oceans Canada	Potential impacts to freshwater and marine habitat that supports species that are harvested by commercial, recreational and aboriginal (CRA) fisheries. The potential impacts would result from the LNG facility site development, construction of the cryogenic rundown and vapour return pipelines, modifications or construction of the marine terminal, dredging of the harbour areas, construction of the wastewater outfall.
<i>Navigable Waters Protection Act</i> or <i>Navigation Protection Act</i> Approval	Transport Canada	Expansion of/modifications to the existing wharf, or construction of a new wharf, to allow LNG carriers to berth.

Permit Required	Governing Agency	Project Component
Disposal at Sea Permit under section 127 of the <i>Canadian Environmental Protection Act</i>	Environment Canada	Potentially required for disposal of marine sediments dredged from the berth face

Discussions on federal permitting requirements will be incorporated into this consultation program where possible, or will be undertaken directly with the appropriate Aboriginal groups.

#### 4.2.4 Ongoing Engagement

Should the proposed Project be approved through the regulatory process, LNG Canada will continue to engage with Aboriginal groups and implement all Project commitments and agreements between LNG Canada and Aboriginal groups, as well as monitor compliance with all regulatory permits and approvals during construction and operations.

Following receipt of the EAC, engagement activities with Aboriginal groups are expected to include:

- Maintaining good long term relationships through open dialogue about issues and concerns that arise during the construction and operations phase of the Project;
- Developing a commitments monitoring program for the Project; and
- Understanding and working to respond to concerns regarding avoidance and mitigation measures for specific circumstances identified during construction and operations as they arise.

## **5.0 DOCUMENTATION AND REPORTING**

### **5.1 Consultation Documentation**

LNG Canada is committed to documenting all Project-related consultation activities to ensure that:

- the consultation process is accurately reflected in documents submitted to regulators and as part of the EA process;
- Interests and issues raised by Aboriginal groups through consultation are captured for the purposes of responding, resolving and/or otherwise addressing any potential impacts to Aboriginal interests raised through the consultation process as appropriate; and
- LNG Canada's follow up actions including responses to issues raised, development of mitigation strategies, or commitments that may be made can be tracked for the purposes of the EA process.

LNG Canada will ensure that relevant communications through the following mediums are recorded:

- phone calls, teleconference call;
- e-mail;
- letters;
- meetings (including regular committee meetings);
- open houses; and
- presentations.

Documentation content will include details about who was present, when and where the engagement took place, what the purpose was and what was discussed. It will also include documentation of any issues or interests raised by Aboriginal groups, what outcomes or actions were taken or what was agreed to in terms of follow up.

### **5.2 Reporting and Tracking Issues and Concerns**

LNG Canada is committed to managing issues of interest and concerns raised by Aboriginal groups at every phase of the consultation process. Key to effectively managing issues will be the use of consultation management database systems and software designed to ensure issues that are raised receive the appropriate dedication of resources from LNG Canada and are identified for follow-up.



LNG Canada is proposing to track comments from Aboriginal groups and LNG Canada’s response to those comments in the following comment tracking table:

**Table 6: Proposed Comment Tracking Table**

ID#	Date	Aboriginal Group	Contact	Method	Topic	Comment, Interest or Concern Raised	LNG Canada Response	Status	EAO Response

**5.3 Aboriginal Consultation Reports**

LNG Canada will prepare Aboriginal Consultation Reports at various stages of the consultation process as set out in the section 11 order, or as otherwise requested by the EAO to:

- summarize the consultation process;
- identify feedback and information received at particular stages of the consultation process;
- identify potential adverse Project impacts on Aboriginal interests;
- identify where and how potential adverse Project impacts have been avoided, mitigated, addressed or otherwise accommodated including changes to project design or other mitigation measures; and
- provide next steps as required.

As identified in the section 11 order, the Aboriginal Consultation Reports summarizing this stage of consultation will be provided to the EAO at the following timelines:

- within 30 days of the deadline for Aboriginal and working group comments on the draft AIR;
- at the time of submission of the Application for an EAC;
- 120 days after the commencement of the Application Review stage; and
- at any other time specified by the EAO.

LNG Canada will provide draft copies of the Aboriginal Consultation Reports for review and comment by the respective Aboriginal groups prior to submission of the reports to the EAO.

## **6.0 SUMMARY**

This Consultation Plan sets a framework for consulting with Aboriginal groups with respect to the proposed Project and establishes broad engagement criteria to guide LNG Canada's regulatory interactions with potentially impacted Aboriginal groups. This Consultation Plan is designed to be flexible so as to meet the specific consultation objectives of LNG Canada, the respective Aboriginal groups, as well as any applicable regulatory requirements identified by provincial and federal agencies.

Given the unique historic, cultural and legal identity of Aboriginal groups in B.C. and the complex and evolving legal/regulatory requirements for consultation, LNG Canada is committed to implementing the activities contemplated in this Consultation Plan for the proposed Project, and to making revisions and updates based on feedback from Aboriginal groups and regulators as appropriate, to ensure that the consultation process is adequate and meets the needs of the participants where practicable.

# **APPENDIX VI:**

## **LNG Canada Fish Salvage Plan**

Fish Salvage Plan for LNG Facility (DFO Referral Number:  
15-HPAC-00314) January 14 2016



**LNG CANADA**

Opportunity for British Columbia. Energy for the world

Joint venture companies



# TABLE OF CONTENTS

1. INTRODUCTION	1
2. FISH SALVAGE PLAN OBJECTIVES	10
3. FISH SALVAGE PLANNING	11
3.1. Introduction	11
3.2. Project Setting and Fish Salvage Access	11
3.3. Climate	11
3.3.1. Fall and Winter	12
3.3.2. Summer	13
3.4. Fish species and life stages within the Project Footprint	13
3.4.1. Kitimat River and Side Channels	13
3.4.2. Anderson Creek	13
3.4.3. Beaver Creek	14
3.4.4. Moore Creek	14
3.4.5. Kitimat River Estuary	14
3.5. Required Permits	16
3.6. Fish Salvage Team	16
3.7. High Level Overview of Proposed Fish Salvage Methodology	16
3.7.1. Isolation Techniques	17
3.7.2. Capture Techniques	18
3.7.3. Care and Handling of Captured Fish	19
3.7.4. Relocation	19
3.7.5. Data Collection and Reporting	20
4. FISH SALVAGE PLAN	22
4.1. Introduction	22
4.1.1. Area Setting	23
4.1.2. Proposed Fish Salvage Methodology	23
4.1.3. Proposed Fish Relocation Sites	26
4.1.4. Contingency planning	26
4.2. Workforce Accommodation Centre	27
4.2.1. Area Setting	27
4.2.2. Proposed Fish Salvage Methodology	28
4.2.3. Proposed Fish Relocation Sites	29
4.2.4. Contingency Planning	29
4.3. Kitimat River Side Channel	31
4.3.1. Area Setting	31
4.3.2. Proposed Fish Salvage Methodology	31
4.3.3. Proposed Fish Relocation Sites	32
4.3.4. Contingency Planning	32
4.4. Phase 2 Beaver Creek Permanent Realignment	33

4.4.1. Area Setting	33
4.4.2. Proposed Fish Salvage Methodology	34
4.4.3. Proposed Fish Relocation Sites	36
4.4.4. Contingency Planning	36
5. REFERENCES	38

## LIST OF TABLES

Table 1. Fish Species of CRA Importance Present within the Project Area	15
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## LIST OF FIGURES

Figure 1. Overview of the LNGC Site that Requires Fish Salvage	4
Figure 2. Beaver Creek Areas Requiring Salvage as a Result of the Phase 1 Diversion	5
Figure 3. Upper Beaver Creek Area Requiring Salvage as a Result of the Workforce Accommodation Centre	6
Figure 4. Kitimat River Side Channel Areas Requiring Salvage as a Result of the LNG Facility	7
Figure 5. Beaver and Anderson Creek Areas Requiring Salvage as a Result of the Construction of the Phase 2 Beaver Creek Permanent Realignment	8
Figure 6. Beaver and Anderson Creek Areas Requiring Salvage Following the Completion of Phase 2 Beaver Creek Permanent Realignment	9
Figure 7. Temperature and Precipitation for 1981 to 2010 Canadian Climate Normals, Kitimat Townsite (Environment Canada, 2015)	12

## LIST OF APPENDICES

Appendix 1. Fish Salvage Monitoring Report Template	
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## ABBREVIATIONS

%	percent
BC	British Columbia
BMP	best management practice
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRA	commercial, recreational and Aboriginal
DFO	Department Fisheries and Oceans Canada
EA	environmental assessment
FAA	<i>Fisheries Act</i> Authorization
HWM	high water mark
km	kilometre
LNG	liquefied natural gas
LNG Canada	LNG Canada Development Inc.
LWD	large woody debris
m	metre
MOE	Ministry of Environment
QEP	Qualified Environmental Professional
RTA	Rio Tinto Alcan
SARA	Species at Risk Act

## Executive Summary

LNG Canada Development Inc. (LNG Canada) is proposing to construct and operate a liquefied natural gas (LNG) export facility in the District of Kitimat, British Columbia (BC). Construction of the LNG Canada Export Terminal (the Project) includes an LNG production and storage site (hereafter referred to as the LNG Facility) as well as a marine terminal to export LNG via shipping.

The LNG Facility is located in the Kitimat River valley and includes: a workforce accommodation centre; a haul road; an LNG loading line; and a water intake, pump house, and pipeline. The LNG Facility footprint overlaps sections of Beaver Creek, Anderson Creek, Moore Creek and a side channel of the Kitimat River, as well as an area of the Kitimat River estuary.

Fish habitats overlapped by the Project footprint include mainstem and off-channel freshwater fish habitat, and estuarine fish habitat. These habitats are used by a range of fish species for rearing, overwintering, foraging, refuge, reproduction, and migration. The footprint also interacts with riparian habitat associated with these areas.

LNG Canada has developed a range of site-specific measures to avoid and reduce potential effects on fish and fish habitat from Project activities, which includes the salvaging of fish using recognized fish capture methods (e.g., multi-pass electrofishing, seine-netting, dip-netting and minnow trapping, as appropriate) prior to conducting instream works such as complete dewatering or infilling. Captured individuals will be released into suitable habitat away from construction activities to reduce the number of fish at risk of injury or mortality.

The purpose of this fish salvage plan is to set out the salvage locations, methods, fish relocation sites, and reporting procedures that will be used to avoid and mitigate potential effects on fish and fish habitat associated with the Project site preparation and construction activities, in the following areas, to reduce the likelihood of fish mortality and minimize localized effects to fish populations:

- Beaver Creek areas affected by Phase 1 Diversion;
- Upper Beaver Creek area affected by the Workforce Accommodation Centre;
- Kitimat River Side Channel areas affected by the construction of the LNG Facility ;
- Beaver and Anderson Creek areas affected by construction of the Phase 2 Beaver Creek Permanent Realignment and the Temporary Construction Facility ; and
- Beaver and Anderson Creek areas affected following the completion of Phase 2 Beaver Creek Permanent Realignment.



The stream sections affected by the proposed construction activities are utilized by rearing juvenile fish, primarily juvenile coho salmon or as a migration corridor for adults to access upstream spawning areas. As such, the fish salvage plan focusses on the exclusion of juveniles from the work areas where possible, and, as needed, the salvage and transplanting of juvenile fish into alternate or replacement habitats within the Beaver Creek and Anderson Creek drainages. These measures have been planned using well established techniques and procedures and will be implemented by qualified staff to maximize the successful salvage of fish and maintenance of the production by species of commercial, recreational, or Aboriginal (CRA) significance.

# 1. INTRODUCTION

The Project site is located in northwest British Columbia where LNG Canada Development Inc. (LNG Canada) is proposing to construct and operate a liquefied natural gas (LNG) export facility in the District of Kitimat, British Columbia (BC). Construction of the LNG Canada Export Terminal (the Project) includes an LNG production and storage site (hereafter referred to as the LNG Facility) as well as a marine terminal to export LNG via shipping.

The LNG facility footprint is located in the Kitimat River valley (Figure 1). The Project includes a workforce accommodation centre; a haul road; an LNG loading line; and a water intake, pump house, and pipeline. The LNG facility footprint overlaps sections of Beaver Creek, and Anderson Creek, their associated side and off-channels, Moore Creek and a side channel of the Kitimat River, as well as the Kitimat River Estuary.

As described in the *Fisheries Act Authorization (FAA)* Application, fish habitats within the proposed Project footprint include mainstem and off-channel freshwater fish habitat and estuarine fish habitat. These habitats are used by a range of fish species for rearing, overwintering, foraging, refuge, reproduction, and migration. The Project footprint also interacts with riparian habitat associated with these areas.

LNG Canada has developed a range of site-specific measures to avoid and reduce potential effects on fish and fish habitat from Project activities, which include salvaging fish prior to conducting instream works such as complete dewatering or infilling:

- according to the standards and procedures outlined in the Fish Collection Methods and Standards prepared for the Resources Inventory Committee (1997), which is accepted fish collection protocol in BC; and
- using recognized fish capture methods (e.g., multi-pass electrofishing, seine-netting, dip-netting and minnow trapping as appropriate) with passive techniques (e.g. techniques which minimize the handling of fish) being prioritized over active techniques (e.g. those that can lead to entanglement), where possible, to reduce fish stress and therefore mortality rates.

Once salvaged, time spent handling fish will be kept to a minimum to reduce stress and lower the overall risk of immediate or delayed fish mortality. Fish measurements will be taken on a sub-sample basis providing that conditions are conducive.

Captured fish will be held in plastic bag-lined vessels (totes, buckets, or tanks) of sufficient size, depending on the size and number of the fish captured, to minimize crowding, and water used

to fill each vessel will be drawn from the aquatic habitat from which the fish were captured. Battery-powered air stones (aerators) will be placed in each vessel to ensure sufficient dissolved oxygen remains in the vessel during holding and transport. During warmer weather conditions the vessels will be staged out of direct sunlight. Once housed the fish and water temperature will be regularly monitored so that behavioral indicators of stress can be quickly identified e.g. increased ventilation frequency, surface respiration or loss of equilibrium. In the event that behavioral stress indicators are identified the following actions will be undertaken, as required:

- Water temperature measurements will be taken from within the vessel and the aquatic habitat from which the fish were captured. If temperature is observed to be increasing or decreasing in the vessel, or if fish behavior shows signs of stress (e.g. surface respiration or changes to equilibrium), supplemental warm/cool water drawn from nearby natural watercourses will be used to buffer the temperature change of the holding/transport vessel.
- Dissolved oxygen measurements will be taken from within the vessel and the aquatic habitat from which the fish were captured. In the event that adjustments in dissolved oxygen are required then additional aerators may be added to the vessel or additional water, from the aquatic habitat from where the fish were captured, will be titrated into to the vessel until baseline conditions are observed.
- Fish holding time will be minimized and relocation will be initiated immediately.

Salvaged fish will be released, as soon as possible, into pre-determined release sites away from construction activities to reduce the number of fish at risk of injury or mortality. As adult fish are more sensitive than juvenile fish to changes in environmental parameters any adult fish captured will be prioritized for relocation during the fish salvage program. Vessels lined with the water-filled bags will be used to transport fish to the selected relocation habitat areas. Upon arrival the bags containing fish will be placed intact in the water, and if required local water will be slowly titrated into the holding bag at the selected relocation habitat to allow temperatures to slowly equalize and enable fish to acclimate before being released.

To reduce holding time and fish stress, salvage crews will be of sufficient size to ensure one crew member is always available to transport fish to release sites should crowding, high temperature or other stressors require an expeditious release.

This Fish Salvage Plan outlines how LNG Canada proposes to implement fish salvage activities associated with the following site preparation construction activities within the LNG facility footprint (Figures 2 to 6):

- Beaver Creek areas affected by Phase 1 Diversion;

- Upper Beaver Creek area affected by the Workforce Accommodation Centre;
- Kitimat River Side Channel areas affected by the LNG Facility;
- Beaver and Anderson Creek areas affected by the construction of Phase 2 Beaver Creek Permanent Realignment and the Temporary Construction Facility ; and
- Beaver and Anderson Creek areas affected following the completion of Phase 2 Beaver Creek Permanent Realignment.

The site preparation construction activities listed above cover the extent of works where fish salvaging is anticipated and planned for in this document. However, if additional works arise that require fish salvaging, the proposed Fish Salvage Methodology presented here will be applied and tailored as necessary.












Kitimat Village

Kitimat River

Douglas Channel

**Legend**

-  Bridge
-  Culvert
-  Existing dyke
-  Freshwater stream mainstem
-  Freshwater streams off-channel
-  Permanent stream realignment preliminary design - subject to change
-  Potential tree clearing
-  Project footprint
-  Wetlands

Metres

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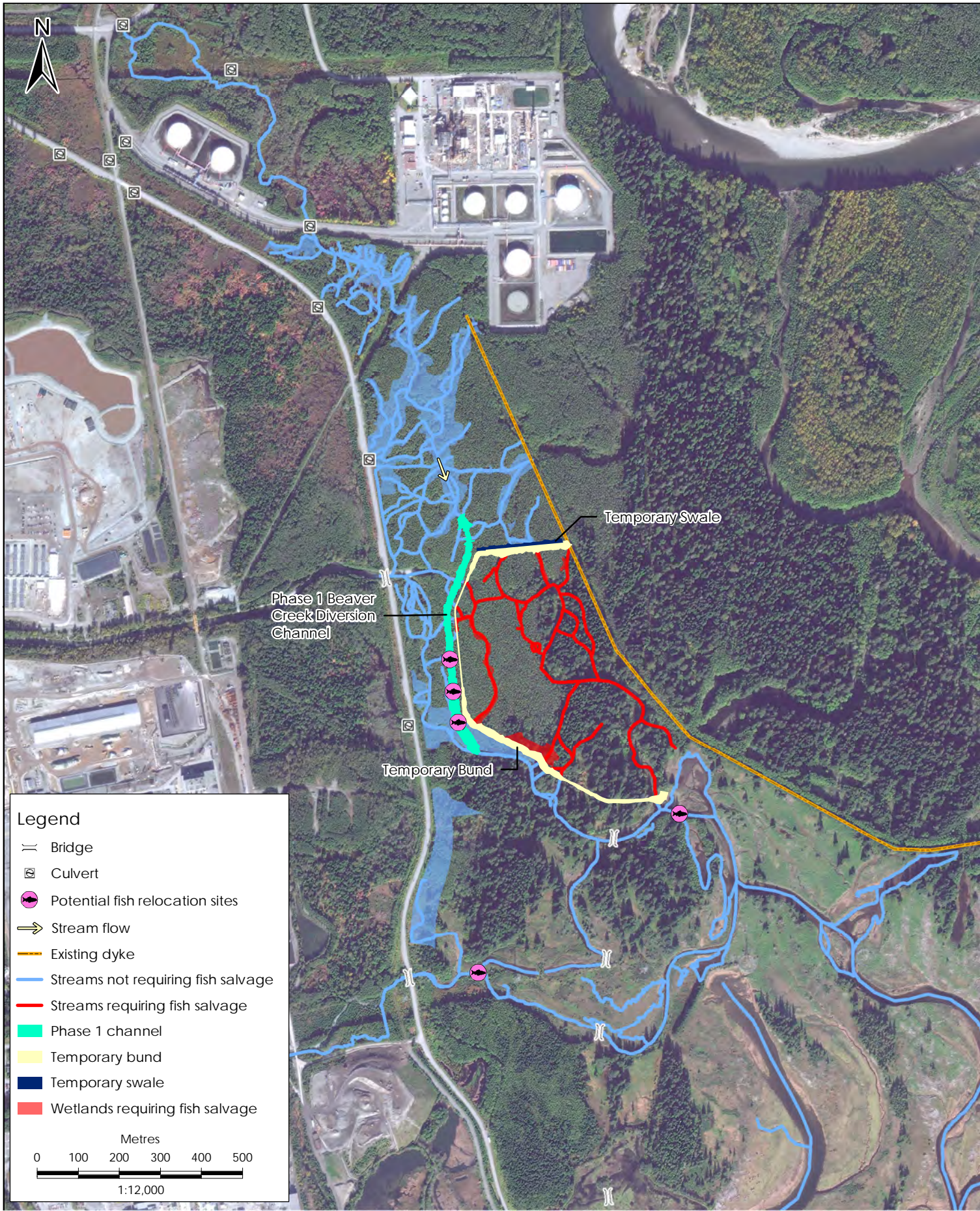


### OVERVIEW OF THE LNGC SITE THAT REQUIRES FISH SALVAGE












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KITIMAT, BRITISH COLUMBIA, CANADA

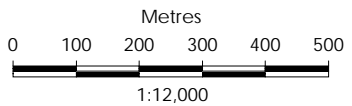
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**Legend**

-  Bridge
-  Culvert
-  Potential fish relocation sites
-  Stream flow
-  Existing dyke
-  Streams not requiring fish salvage
-  Streams requiring fish salvage
-  Phase 1 channel
-  Temporary bund
-  Temporary swale
-  Wetlands requiring fish salvage

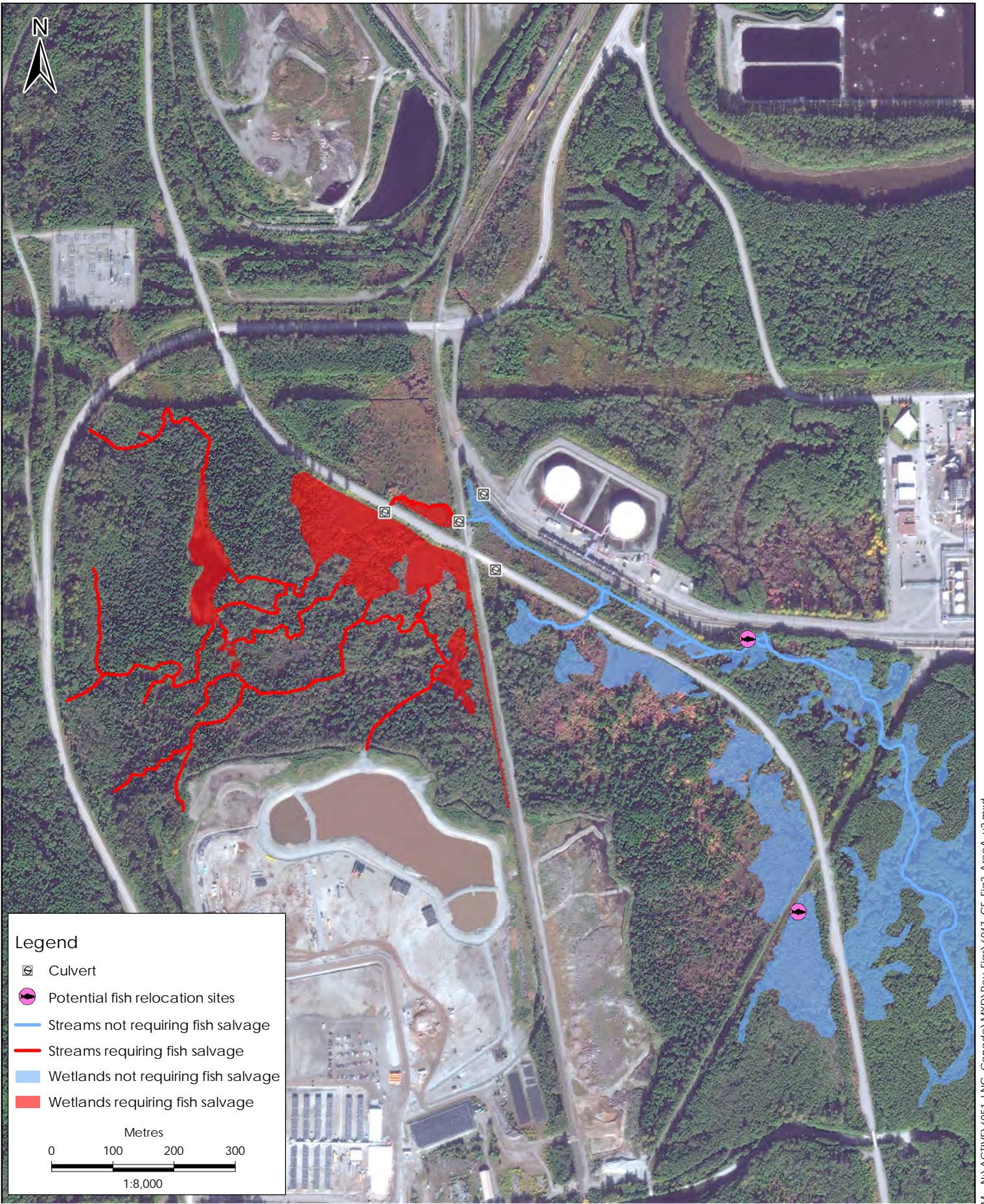


**BEAVER CREEK AREAS REQUIRING FISH SALVAGE  
AS A RESULT OF PHASE 1 DIVERSION**







LNG CANADA EXPORT TERMINAL  
KITIMAT, BRITISH COLUMBIA, CANADA

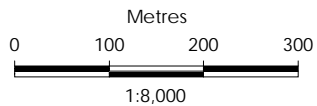
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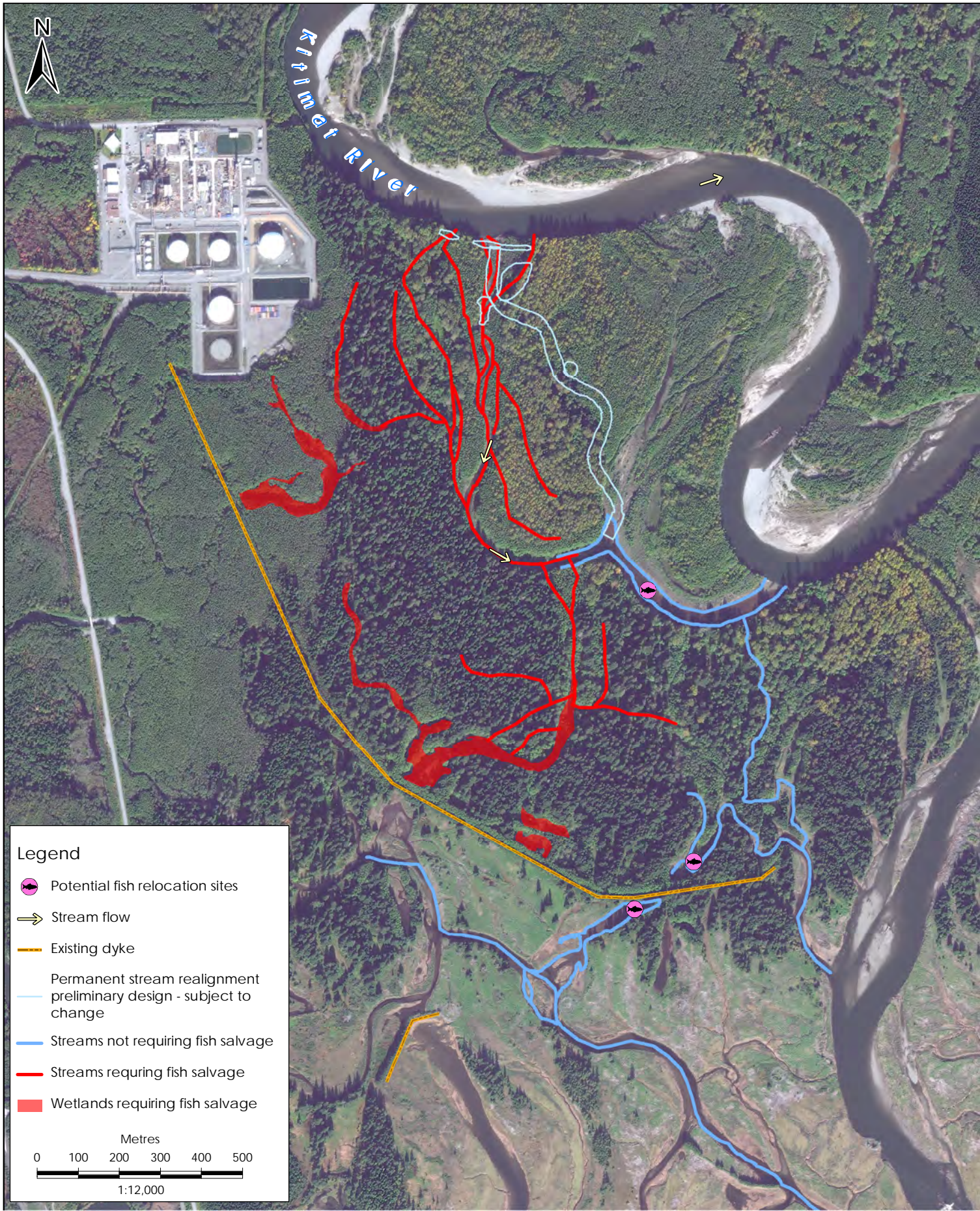
-  Culvert
-  Potential fish relocation sites
-  Streams not requiring fish salvage
-  Streams requiring fish salvage
-  Wetlands not requiring fish salvage
-  Wetlands requiring fish salvage










**UPPER BEAVER CREEK AREA REQUIREING FISH SALVAGE AS A RESULT OF THE WORKFORCE ACCOMMODATION CENTRE**

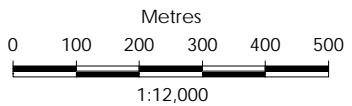
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KITIMAT, BRITISH COLUMBIA, CANADA

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DATE	15-DEC-15	FIGURE NO.	3



**Legend**

-  Potential fish relocation sites
-  Stream flow
-  Existing dyke
-  Permanent stream realignment preliminary design - subject to change
-  Streams not requiring fish salvage
-  Streams requiring fish salvage
-  Wetlands requiring fish salvage



**KITIMAT RIVER SIDE CHANNEL AREAS REQUIRING FISH SALVAGE AS A RESULT OF THE LNG FACILITY**

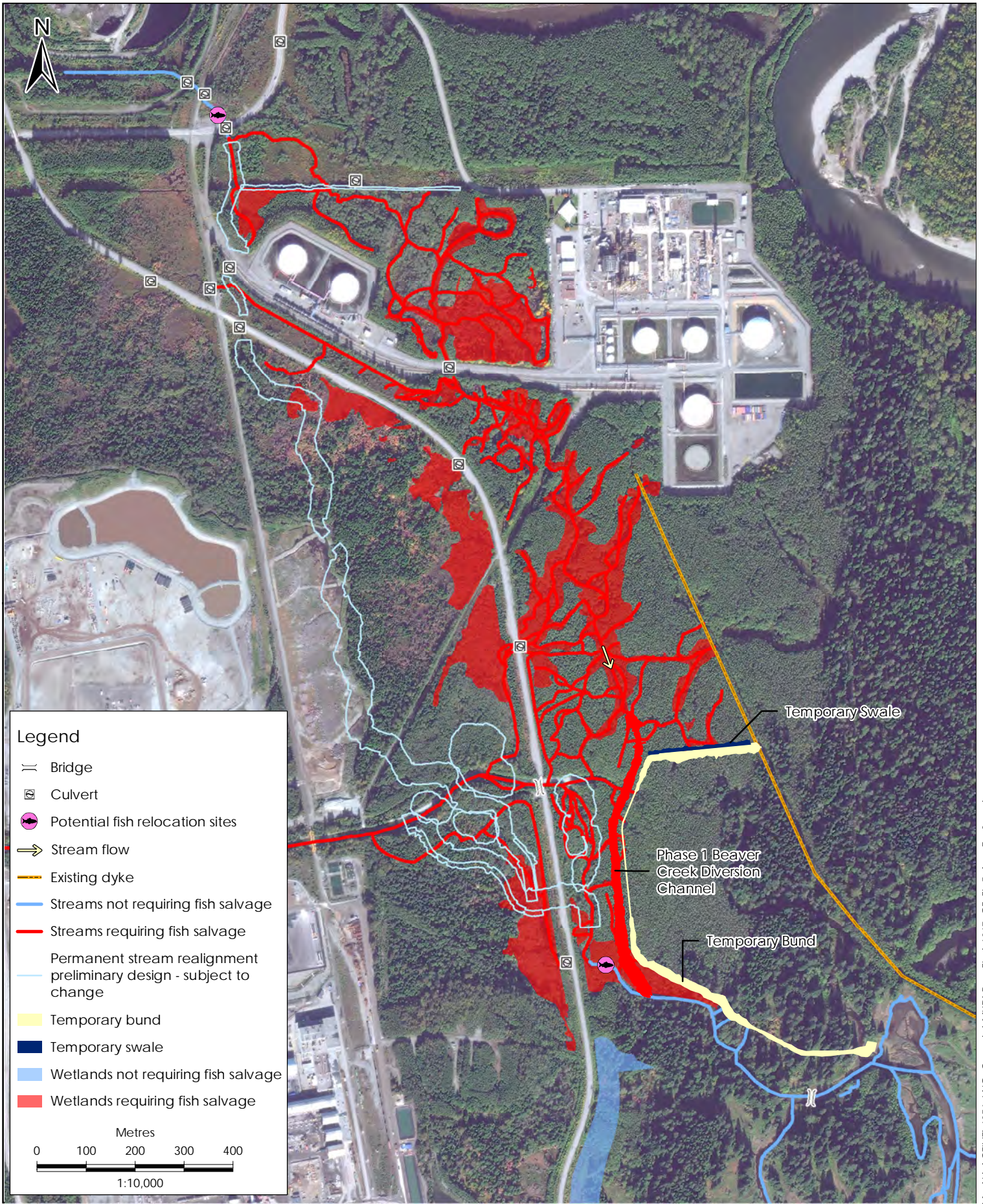
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KITIMAT, BRITISH COLUMBIA, CANADA

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













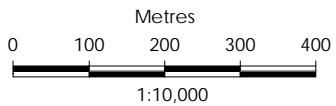
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**Legend**

-  Bridge
-  Culvert
-  Potential fish relocation sites
-  Stream flow
-  Existing dyke
-  Streams not requiring fish salvage
-  Streams requiring fish salvage
-  Permanent stream realignment preliminary design - subject to change
-  Temporary bund
-  Temporary swale
-  Wetlands not requiring fish salvage
-  Wetlands requiring fish salvage

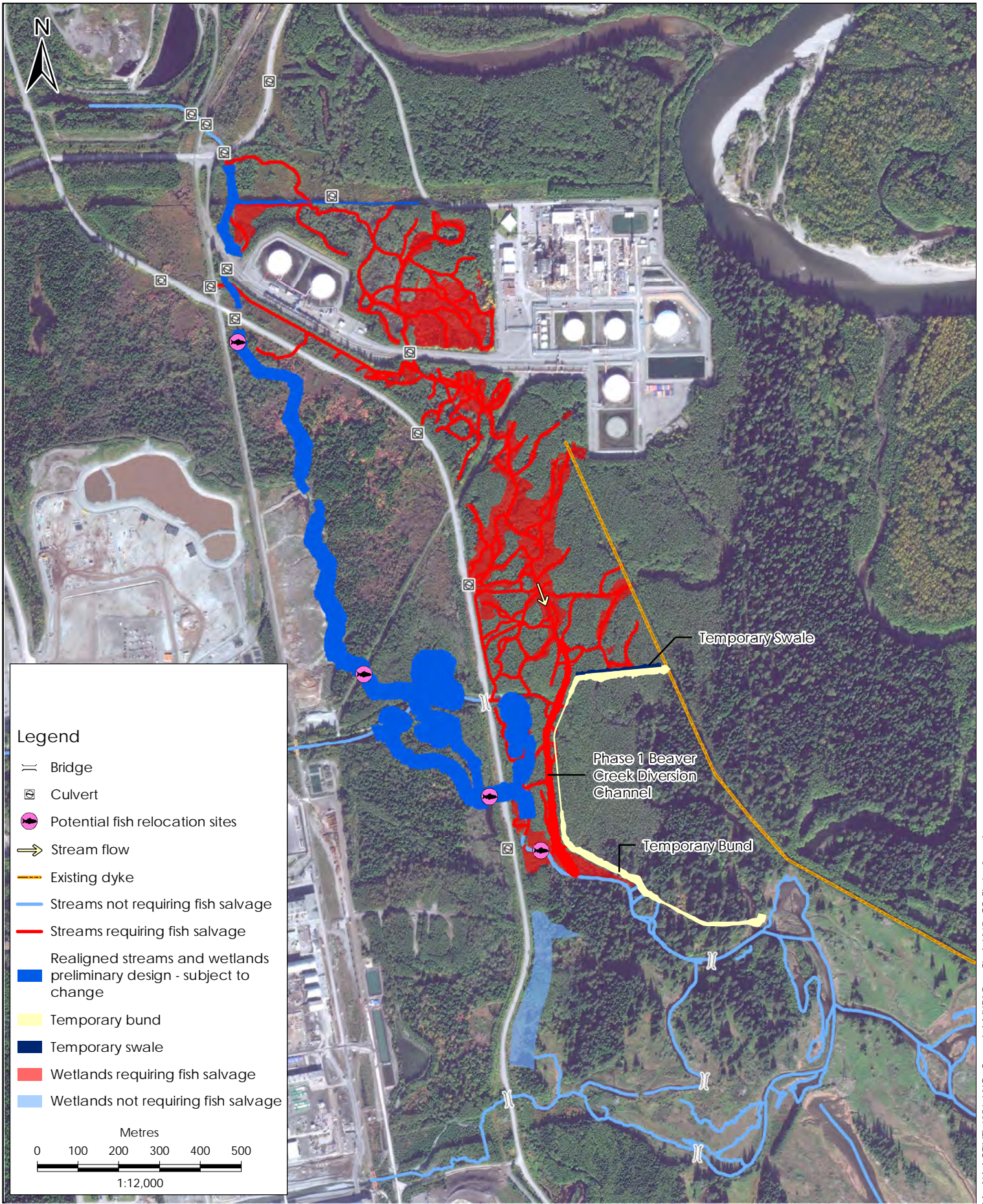


**BEAVER AND ANDERSON CREEK AREAS REQUIRING FISH SALVAGE AS A RESULT OF THE PHASE 2 PERMANENT REALIGNMENT AND THE TEMPORARY CONSTRUCTION FACILITY**

LNG CANADA EXPORT TERMINAL  
KITIMAT, BRITISH COLUMBIA, CANADA

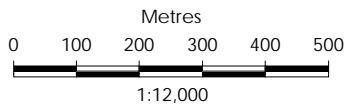
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**Legend**

- Bridge
- Culvert
- Potential fish relocation sites
- Stream flow
- Existing dyke
- Streams not requiring fish salvage
- Streams requiring fish salvage
- Realigned streams and wetlands preliminary design - subject to change
- Temporary bund
- Temporary swale
- Wetlands requiring fish salvage
- Wetlands not requiring fish salvage



**BEAVER AND ANDERSON CREEK AREAS REQUIRING FISH SALVAGE FOLLOWING THE COMPLETION OF PHASE 2 PERMANENT REALIGNMENT**

LNG CANADA EXPORT TERMINAL  
KITIMAT, BRITISH COLUMBIA, CANADA

PROJECTION	UTM9	DRAWN BY	GF
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## 2. FISH SALVAGE PLAN OBJECTIVES

The objectives of this fish salvage plan is to identify the:

- factors that must be accounted for and mitigated, as required, in fish salvage planning;
- particular fish salvage methodology that will be employed within each of the proposed construction work areas;
- areas requiring fish salvage during the construction of the Project ;
- potential fish relocation sites;
- permit requirements for undertaking all fish salvage work;
- reporting procedures; and
- required contingency measures.

## **3. FISH SALVAGE PLANNING**

### **3.1. Introduction**

Construction of the LNG Facility will impact much of the juvenile rearing fish habitat along Beaver Creek. As such, offsetting the loss of these habitats has been the focus of planning efforts during the environmental assessment, development of a fish habitat compensation plan and initial planning of the construction for the proposed works. During construction and associated instream works, it is expected that fish will be utilizing the affected streams during this period, careful planning for the salvage of these fish prior to the sequential cutoff of and re-direction of streamflow into the proposed new stream channels has been undertaken. This section documents the factors considered in that planning.

### **3.2. Project Setting and Fish Salvage Access**

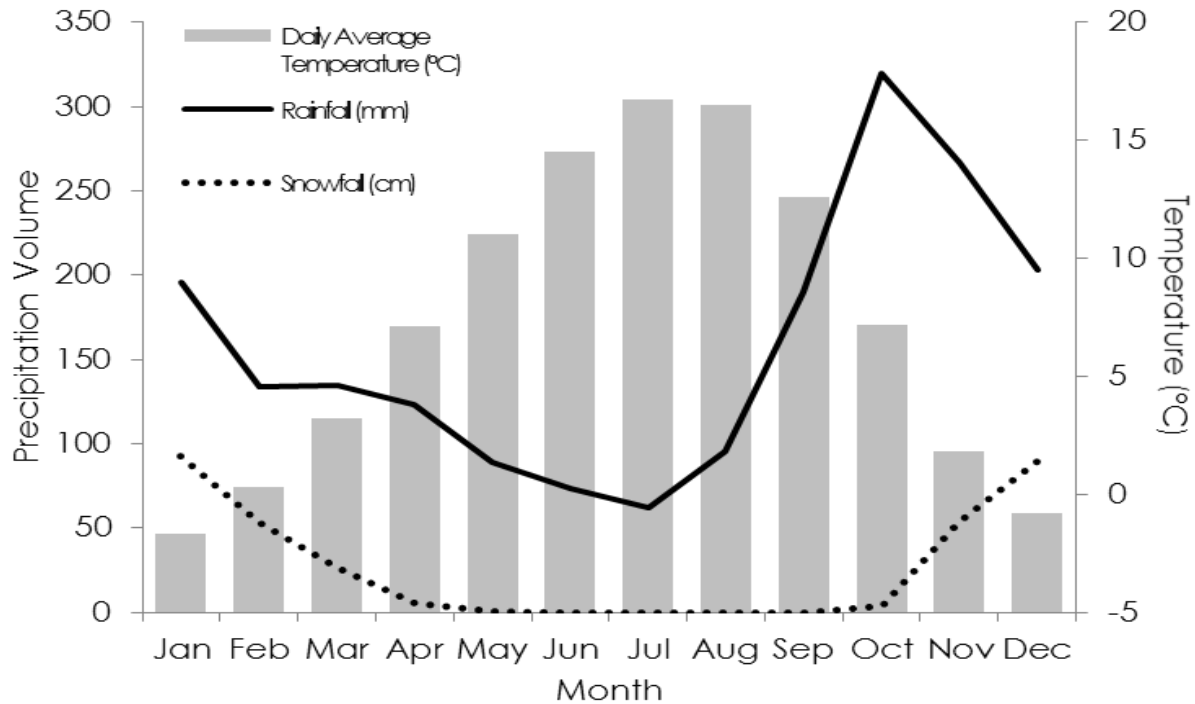
The Project is located at the south end of the Kitimat valley which extends north from Kitimat towards the city of Terrace located in the Skeena River valley. The Kitimat valley is bounded by mountainous terrain, part of the Coast Mountains, with the Kitimat River extending south along the valley bottom to the Kitimat Arm of Douglas Channel.

The Project is located north and east of the existing Rio Tinto (RT) industrial development and is bounded to the south by the Kitimat Arm and the Kitimat River estuary. There are existing access roads within the vicinity of the site such as the former Eurocan Haul Road and recently constructed spur roads, which should be sufficient to gain general access to the areas requiring fish salvage. However, to ensure safe access to the work areas, additional trail development, including brushing, stair and possibly personnel bridge construction, will be required.

### **3.3. Climate**

Kitimat's climate is characterized as moderate maritime and influenced by both the north-south valley configuration delivering windy and cooler temperatures from the north, and by Kitimat Arm of Douglas Channel which acts to moderate seasonal temperatures and deliver moisture-laden air to the area. Combined, these conditions cause significant snow accumulation during winter months and heavy precipitation during the fall and winter period (September to February; Figure 7) which can cause significant water level spikes in regional rivers, creeks, and drainages. Conversely, streams in the Kitimat area typically become very low during the summer months, with many side and off-channels becoming temporarily dry or unconnected from the main-stem. In winter, Kitimat can receive large snowfall accumulations, which in conjunction with moderating effects of the nearby marine environment, can prevent much of the valley bottom (and drainages) from freezing solid; however, Kitimat can receive short periods of cold arctic

outflow winds with temperatures below - 20°C that will result in ice forming on the isolated channels.



**Figure 7. Temperature and Precipitation for 1981 to 2010 Canadian Climate Normals, Kitimat Townsite (Environment Canada, 2015)**

Fish salvage activities will be affected by the regional weather conditions, with affects vary by season, as follows:

### 3.3.1. Fall and Winter

Fall and winter precipitation in Kitimat can cause rapid increases in stream flow and wetlands can become quickly inundated, both of which can affect the efficacy of fish salvage activities by impeding access to sites and distributing fish throughout a broader area. Snow and ice conditions in Kitimat from late fall through to early spring can create challenges for access and can reduce sampling effectiveness, particularly for electrofishing when water temperatures are below 5°C. Ice cover over wetland habitats and slow moving off-channel habitats will also affect salvage effectiveness and may in some instances preclude it from being undertaken or significantly reduce the efficacy.

### **3.3.2. Summer**

As illustrated on Figure 7 the area sees increased temperatures throughout the summer months. As a result key considerations for fish salvage in summer months in the region will be ensuring appropriate water temperature is maintained in holding areas or containers, and that salvaged fish are released into habitats that are not isolated from the main stream network, have appropriate water temperatures, and are not at risk of dewatering.

## **3.4. Fish species and life stages within the Project Footprint**

The Project area supports fish species of commercial, recreational and Aboriginal (CRA) interest (Table 1). The Kitimat River, Beaver Creek, Anderson Creek and Moore Creek each provide seasonal habitat for numerous species of fish of varying life stages. Each species has unique run-timing and habitat preferences for spawning, rearing, migration, and overwintering which can affect the efficacy and timing of fish salvage activities. The following Sections provide specific fish species and life stages for each of the areas in which site preparation construction activities will be undertaken.

### **3.4.1. Kitimat River and Side Channels**

The Kitimat River supports a wide array of freshwater and anadromous fish species, including all five Pacific salmon (chinook, coho, chum, pink, and sockeye salmon), trout (steelhead, rainbow [*Oncorhynchus mykiss*], and cutthroat), char (Dolly Varden), and several non-salmonid species (MacDonald and Shepherd 1983; BC MOE 2014). Eulachon are known to spawn in the Kitimat River in late winter/early spring in the vicinity of the Project area (Pedersen et al. 1995).

The Kitimat River Side Channel is suspected to be used for spawning by chum salmon and may also provide habitat for juvenile salmon. As such, salvage is planned for this watercourse.

Spawning Eulachon were not captured in the Project area during baseline studies, however visual surveys should be completed in side channels to the Kitimat River in March if any works are scheduled there at that time as Kitimat River Eulachon are listed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2011).

### **3.4.2. Anderson Creek**

According to BC MOE (2014), salmonid species in Anderson Creek include chum, pink, and coho salmon. Additional salmonids identified in Anderson Creek during previous investigations include chinook and sockeye salmon, rainbow trout, and Dolly Varden (BC MOE 2014). Other species observed include Pacific lamprey, three-spined stickleback, Pacific staghorn sculpin, and starry flounder. Trout spawning typically takes place in spring with most trout fry typically emerging by May or June. Chum and pink salmon spawners are expected to migrate into freshwater by mid-August (BC MOE 2014) and commence spawning shortly thereafter. Coho salmon in-migration

to freshwater is expected to take place during September and October with spawning taking place in fall and early winter (McPhail 2007; BC MOE 2014). Dolly Varden spawn in autumn.

### **3.4.3. Beaver Creek**

Coho salmon use Beaver Creek as spawning habitat (Warrington 1987) but spawning habitat is lacking within the Project footprint. Juvenile coho, considered to mostly be recruited from nearby systems, are known to use Beaver Creek for rearing and overwintering. Additional species observed in Beaver Creek include rainbow trout, cutthroat trout, and Dolly Varden (BC MOE 2014). Coho salmon are considered to be the main fish species that migrate through the Project Footprint to access Beaver Creek spawning areas (outside of Project Footprint); this is expected to take place during September and October (McPhail 2007; BC MOE 2014).

### **3.4.4. Moore Creek**

According to BC MOE (2014), coho and pink salmon have been observed in Moore Creek. Additional fish species recorded in Moore Creek include cutthroat trout, rainbow trout (Triton 2009; 2010), three-spined stickleback, coastrange sculpin (*Cottus aleuticus*), and prickly sculpin (*Cottus asper*; BC MOE 2014).

### **3.4.5. Kitimat River Estuary**

Early life history studies determined that juvenile chum, coho, and chinook salmon use the estuary and tidal channels extensively in the Kitimat area and in Minette Bay. The majority of salmonid fry and smolts out-migrate from the river by late April and May of each year (Slaney et al. 1982). Juvenile pink salmon and chum salmon migrate downstream to the Kitimat River estuary following emergence in the spring. Juvenile chinook and coho salmon rear for up to two years in the lower Kitimat River mainstem and adjacent tributaries and smolt migration into the estuary coincides with spring freshet events. Also, as discussed previously, migration of coho salmon fry into estuarine habitat (considered to be passive) was observed during and following fall freshet. In terms of adult salmon in-migration, chinook salmon return to the estuary from June to August, coho salmon return from August to October, chum salmon and pink salmon return during in August, steelhead return from March to May, and cutthroat trout return in all months of the year.

Eulachon larvae passively drift to the estuary from freshwater areas of incubation immediately upon emergence in late spring/early summer (Hay and McCarter 2000; McPhail 2007). Threespined stickleback and Pacific staghorn sculpin are found in estuary channels at all life stages year-round. To a lesser extent, juvenile and adult cutthroat trout and Dolly Varden also make use of the Kitimat river estuary.

**Table 1. Fish Species of CRA Importance Present within the Project Area**

Species ( <i>Latin name</i> )	Beaver Creek	Anderson Creek	Kilimat River Side Channel	Moore Creek
Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> )	X	X	X	
Chum Salmon ( <i>Oncorhynchus keta</i> )		X	X	X
Pink Salmon ( <i>Oncorhynchus gorbuscha</i> )		X	X	X
Sockeye Salmon ( <i>Oncorhynchus nerka</i> )		X	X	
Coho Salmon ( <i>Oncorhynchus kisutch</i> )	X	X	X	X
Steelhead Trout ( <i>Oncorhynchus mykiss</i> )			X	
Rainbow Trout ( <i>Oncorhynchus mykiss</i> )	X	X	X	X
Cutthroat Trout ( <i>Oncorhynchus clarkii</i> )	X		X	X
Dolly Varden ( <i>Salvelinus malma</i> )	X	X	X	
Eulachon ( <i>Thaleichthys pacificus</i> )			X	



### **3.5. Required Permits**

Prior to commencing the fish salvage activities, as defined in this fish salvage plan, the below permits will be secured:

- Provincial Fish Collection Permit; and
- Federal License to Fish for Scientific, Experimental or Educational Purposes.

### **3.6. Fish Salvage Team**

The fish salvage team will be led by an experienced senior biologist (a Qualified Environmental Professional (QEP)) who will be responsible for managing the salvage and isolation work. They will be supported by 3 to 4 teams, as needed, each consisting of a lead biologist and two fisheries technicians (one technician to assist with salvaging fish and one to act as a “runner” to move salvaged fish to the recovery areas during the fish salvage activities).

Also, once fish exclusion fencing has been put in place and salvage work completed, routine monitoring of the efficacy of the exclusion works will be undertaken. It is anticipated that this work will be undertaken by the on-site environmental monitor on a routine basis and especially during any increases in stream flow as a result of rain events.

### **3.7. High Level Overview of Proposed Fish Salvage Methodology**

Prior to instream work, existing fish-bearing habitats will be isolated from flow and adjacent fish bearing areas. Fish will then be salvaged from the isolated work areas using recognized fish capture methods (e.g., multi-pass electrofishing, seine-netting, dip-netting and minnow trapping, as appropriate) prior to complete dewatering or infilling. Captured individuals will be released into suitable habitat away from construction activities to reduce the number of fish at risk of injury or mortality. Based on professional judgment, the effectiveness of this mitigation measure is expected to be high except during extended cold periods when trapping efficacy is expected to be lower. During the salvage it will be important to minimize stress and mortality to fish associated with capturing and relocation activities during the fish salvage. Stress to fish can result from:

- physical intrusions into habitat areas (which may elicit a predator avoidance response);
- subjection to physical shock and trauma during capture and handling;
- changes to environmental variables including water quality (dissolved oxygen, temperature, salinity, pollutants, etc.) during handling and transport; and
- time out of water.

All of these factors can negatively affect fish tolerance to natural stressors and ultimately reduce survival. As stress factors are cumulative, steps will be taken throughout the fish salvage to ensure effects on captured fish are minimal.

Initially, site preparation, clearing and grubbing, will be required for all areas and these activities have the potential to cause erosion and mobilization of sediment, which may lead to a deterioration of water quality. It is expected that standard erosion and sediment control measures including, but not limited to:

- sediment and erosion control requirements and potential risks will be covered in the mandatory site orientation;
- installation of barriers or silt fencing;
- use of degradable filtration and stabilization media;
- construction of sediment basins, polyethylene plastic or coco-matting to protect exposed areas; and
- clean straw wattles.

Fish will be collected according to the standards and procedures outlined in the Fish Collection Methods and Standards prepared for the Resources Inventory Committee (1997), which is accepted fish collection protocol in BC.

In stream sections that can be isolated, salvage will continue until two effective electrofishing passes have been completed with no fish captured. For small wetlands and isolated pools that can be pumped down, salvage will continue until water has been withdrawn. For larger wetlands that cannot be drawn down or effectively sampled by electrofishing due to depth, salvage efforts will continue until capture rates are minimal. For these habitats, additional salvage will have to be completed in conjunction with infilling, with small areas isolated with nets and salvaged to zero captures before fill material is deposited.

### **3.7.1. Isolation Techniques**

Prior to fish capture, stop nets with a lead bottom line will be used (in association with rigid backing such as chain-link fencing, as/if required) at upstream and downstream ends of stream reaches proposed for fish capture to prevent fish from swimming into and out of the site. These nets will also enable effective fish herding and facilitate efficient capture which will minimize stress. Stop nets will also enable stream reaches to be assessed individually for fish numbers and enable reaches to be safely and effectively managed once the salvage is complete.

For salvage in wetlands and areas of standing water, zippered stop nets (i.e. nets with panels that can be added and removed) would be used to create working polygons in which the salvage efforts would focus.

Portable water pumps may also be used to draw water levels down to facilitate fish capture. This would be performed carefully and in areas where dewatering effects could be managed safely by the salvage crew. Suitable fish screens will be utilized on all pump intakes to avoid fish mortality and any dewatering activities related to fish salvaging will be completed in a manner to ensure outlet flows are managed for erosion and sediment control and refueling and spill response procedures are implemented.

### **3.7.2. Capture Techniques**

Fish capture techniques in freshwater stream environments are generally separated into two categories, active or passive. Active techniques involve gear moved through the water either by machine or human power to capture fish (electrofishing, angling, seining, dip-netting, etc.). Passive techniques involve placement of stationary gear within habitat areas to attract and trap fish (minnow traps) or to capture and intercept moving fish (trap nets, gill nets, etc.).

Stress and mortality rates in fish varies considerably depending on the techniques used, and therefore high-stress active techniques (e.g. those that can lead to entanglement) will generally be avoided, or applied after trying passive techniques (e.g. techniques which minimize the handling of fish) which tend to be less stressful for fish. The field crew supervisor will determine, on a site by site basis, whether active or passive (or combination) techniques will be used (primarily on water temperature and channel characteristics, such as depth) at the salvage site.

Where minnow traps will be used as the initial capture technique the following standards will be implemented for the first trapping effort, so that the data can be referenced in future 'Effectiveness Monitoring Studies' that will be undertaken post-construction:

- Soak time will be for a 24 hour period;
- Each trap will be baited with 22.5 grams of salmon roe and 10 pellets of cat food;
- Location of the traps will be recorded; and
- Five pairs (2 traps) of traps (10 in total) will be set for every 100 m of watercourse length.

Following the first standardized trapping effort of 24 hours the technique(s) used will be determined by the field crew supervisor in order to maximize salvaging success.

### **3.7.3. Care and Handling of Captured Fish**

Time spent handling live fish will be kept to a minimum to reduce stress and lower the overall risk of immediate or delayed fish mortality. Fish measurements will be taken on a sub-sample basis providing that conditions are conducive.

Captured fish will be held in plastic bag-lined vessels (totes, buckets, or tanks) of sufficient size, depending on the size and number of the fish captured, to minimize crowding, and water used to fill each vessel will be drawn from the aquatic habitat from which the fish were captured. Battery-powered air stones (aerators) will be placed in each vessel to ensure sufficient dissolved oxygen remains in the vessel during holding and transport. During warmer weather conditions the vessels will be staged out of direct sunlight. Once housed the fish and water temperature will be regularly monitored so that behavioral indicators of stress can be quickly identified e.g. increased ventilation frequency, surface respiration or loss of equilibrium. In the event that behavioral stress indicators are identified the following actions will be undertaken, as required:

- Water temperature measurements will be taken from within the vessel and the aquatic habitat from which the fish were captured. If temperature is observed to be increasing or decreasing, or if fish behavior shows signs of stress (e.g. surface respiration or changes to equilibrium) supplemental warm/cool water drawn from nearby natural watercourses will be used to buffer the temperature change of the holding/transport vessel.
- Dissolved oxygen measurements will be taken from within the vessel and the aquatic habitat from which the fish were captured. In the event that adjustments in dissolved oxygen are required then additional aerators may be added to the vessel or additional water, from the aquatic habitat from where the fish were captured, will be titrated into to the vessel until baseline conditions are observed.
- Fish holding time will be minimized and relocation will be initiated immediately.

As adult fish are more sensitive than juvenile fish to changes in environmental parameters, as their demand for dissolved oxygen is greater, especially when experiencing stress, any adult fish captured (mainly rainbow or cut-throat trout) will be prioritized for relocation during the fish salvage program, as juvenile fish can be held safely for longer periods, provided adequate monitoring occurs. To reduce holding time and fish stress, salvage crews will be of sufficient size to ensure one crew member is always available to transport fish to release sites should crowding, high temperature or other stressors require an expeditious release.

### **3.7.4. Relocation**

Relocating fish quickly will be key to minimizing stress, therefore identifying relocation habitats in close proximity to salvage areas is important. Efforts will be made to relocate fish within their

natural drainage system first, and if deemed not feasible then relocation sites will be identified that generally represent habitat from which fish were originally captured based on the following criteria:

- amount of available cover;
- connectivity to adjacent and varied habitats;
- appropriate velocity;
- appropriate substrate; and
- suitable water quality.

Fish will be relocated to areas not planned for further development to eliminate the need to salvage twice, thus limiting stress. If this is not practical fish will be relocated to areas where they can complete the rearing life-stage and out-migrate (i.e. Beaver Creek mainstem upstream of Phase 1 Diversion) prior to the next phase of the site development. Areas with poor water quality (low dissolved oxygen) will not be selected for destination habitats.

Buckets or containers lined with water-filled bags would be used to transport fish to the selected relocation habitat areas. Upon arrival the bags containing fish will be placed intact in the water and if required local water will be slowly titrated into the holding bag at the selected relocation habitat to allow temperatures to slowly equalize and enable fish to acclimate before being released.

### **3.7.5. Data Collection and Reporting**

Fish salvage crews will focus on collection of data to effectively demonstrate that fish capture and relocation has occurred to the greatest extent practicable in habitat areas proposed to be affected by key Project activities. The following is the minimum data that will be collected during the fish salvage work which will meet the standard DFO and MOE permit reporting requirements:

- date;
- location (general and UTM's);
- crew;
- weather;
- isolation technique;
- effort;
- species;
- stage;

- number by species; and
- number of mortalities by species.

The data collected will be documented in a dedicated Fish Salvage Monitoring Report template (Appendix 1). This template will be tailored to meet the needs of the specific Project activities and any FAA Authorization or permit conditions.

## 4. FISH SALVAGE PLAN

### 4.1. Introduction

This section provides specific details on the proposed fish salvage plan for each of the early works construction areas.

The Fish Salvage Plan will be conducted for the following site preparation construction activities within the LNG facility footprint (Figures 2 to 6).

#### Phase 1 Beaver Creek Diversion

- Excavation of Phase 1 Beaver Creek Channel (600 m) and Swale (200 m)
- Collection and diversion of a section of Beaver Creek flow into temporary Swale and diversion channel (Figure 2)

#### Development of Workforce Accommodation Centre

- Site preparation and infilling of the Workforce Accommodation Centre adjacent to Haisla Boulevard (Figure 3)

#### Kitimat River Side Channel Excavation

- LNG Facility Construction (Figure 4)

#### Phase 2 Beaver Creek Permanent Realignment and Project Development Area

- Upper Beaver Creek realignment which begins immediately downstream from Haisla Boulevard and would flow generally parallel to the RT rail line (on the east side), before heading southeast to its confluence with the realigned Anderson Creek (Figure 5). A wetland connector channel will also be constructed to intercept any drainage from the wetland area northeast of the upstream end of the realignment
- Construction of the site for the Project Development Area which will contain temporary laydown areas, construction facilities (site clinic, HSSE training centre, offices, crib room, workshops, and warehouses), and construction utilities (fuel storage, vehicle wash, storm water management systems)
- Decommissioning of the Phase 1 Beaver Creek Diversion Channel, and infilling of the north end of Beaver Creek south of the Methanol plant as well as west of Methanol plant (Figure 6)

The remainder of this Section presents further details of each of the site preparation construction activities being undertaken and the proposed fish salvage methodology that will be employed to reduce the likelihood of fish mortality and minimize localized effects to fish populations.

#### **4.1.1. Area Setting**

Beaver Creek is a tributary of Anderson Creek, which in turn flows into the lower Kitimat River. The confluence of Anderson Creek and the Kitimat River occurs in a tidally influenced area, immediately upstream from the estuary.

Phase 1 Beaver Creek Diversion area, is low relief and seasonally inundated throughout with shallow swales, isolated pools, abandoned and active channels. Area D comprises lower Beaver Creek and its tributaries and is bounded roughly by Anderson Creek to the south, Dyke Access Road to the east, north by the Temporary Swale (an existing access road) and by the proposed Phase 1 Beaver Creek Channel to the west (Figure 2). The riparian areas consist primarily of mature mixed forest which consists of a dense canopy and abundant ground shrub species.

Waterbodies are low gradient (< 1.0 %) and consist primarily of large channel and run habitat with abundant large woody debris (LWD) and fines to small gravel substrates.

Affected waterbodies within Phase 1 Beaver Creek Diversion area, include:

- lower Beaver Creek mainstem, bounded on the north by the mainstem diversion (deflection) point at the Phase 1 Beaver Creek Channel;
- off-channels to Beaver Creek mainstem that currently flow through the Temporary Swale;
- five small tributaries (<250 m) to lower Beaver Creek mainstem, bounded to the east by the dyke access road; and
- ephemeral channels potentially interconnecting between Beaver and Anderson Creek floodplains that will be at least partially dewatered through the Phase 1 Beaver Creek Channel excavation.

#### **4.1.2. Proposed Fish Salvage Methodology**

Completion of Phase 1 Beaver Creek Diversion will involve the following key activities as they relate to fish salvage:

- Establishment of fish exclusion fences at the confluence of numerous off-channels within lower Beaver Creek to prevent fish in-migration to these channels from the mainstem within Phase 1 Beaver Creek Diversion. Following installation of the exclusion fencing and receipt of the applicable FAA, the off-channels will be examined by fisheries specialists and any fish present will be salvaged and moved to a relocation site (likely upstream of the proposed works). As required by DFO, there will be no barriers to fish movement in Beaver Creek mainstem until the diversion works are opened to allow upstream/downstream movement of adult and juvenile fish. Side channels with both an entrance from and an exit to Beaver Creek mainstem, will remain accessible as the



installation of exclusion fencing at the upper end of the channel could become a source of mortality for juvenile fish, through impingement on the screening as they seek refuge habitat during flow increases.

- It is expected that Beaver Creek flows will increase and decrease during this period and thus routine monitoring of the fish exclusion fences will be required. Monitors will have to ensure the fences are cleaned of debris (primarily leaf litter) and if an increase in flow results in flow past the fencing then the back channel will have to be examined to determine if fish have gained access. If this occurs, fish salvage, likely with minnow traps, will be initiated and fish relocated as discussed above. It is recommended that this is completed as soon as fish are observed past the fencing as flows are unpredictable and can drop overnight which could result in holding of fish in areas that become dry.
- Fish salvage within the side and mainstem channel(s) will be conducted at the time of implementation of the diversion into the Phase 1 Beaver Creek channel. This will require the placement of stop nets at the upstream and downstream ends of each channel to assist the salvage and prevent fish from re-populating these sections as flows are decreased.

#### **4.1.2.1. Proposed Fish Salvage at the time of diversion to the Phase 1 Channel**

Prior to initiation of the diversion, a stop net (3/8 inch [0.95 cm] stretch mesh) supported by a chain link fence will be erected on lower Beaver Creek mainstem at its confluence with Anderson Creek and at the upstream point of diversion to prevent juvenile salmonid in-migration into the mainstem while the diversion is completed over a planned period of seven days. This structure will require continuous monitoring and cleaning. Collectively, the establishment of downstream and upstream mainstem and tributary stop nets will effectively isolate the lower Beaver Creek watershed between its confluence with Anderson Creek and the diversion point at the head of Phase 1 Channel.

#### **4.1.2.2. Construction of the Phase 1 Beaver Creek Channel**

The substantial portion of Phase 1 Beaver Creek Channel excavation will occur in areas unconnected to Beaver Creek mainstem and Anderson Creek. Construction would occur in an upstream direction beginning approximately 5 m upstream from Anderson Creek mainstem and finishing about 5 m from the Beaver Creek mainstem diversion point. Any small interconnecting channels or small tributaries encountered during the construction will be salvaged for fish. At this stage, Phase 1 Beaver Creek Channel would remain unconnected to fish bearing water. Turbid construction water from the Channel can be pumped into a sedimentation pond or vegetated area to prevent re-entry into the watercourse. Turbidity will be monitored during all in-stream works. Once this stage of Phase 1 Beaver Creek Channel construction is completed, the

downstream 5 meter "tie-in" can be slowly and carefully excavated to grade to minimize the release of any remaining turbid water into Anderson Creek mainstem. The tie-in to Anderson Creek will need to occur prior to any diversion of Beaver Creek flow.

Beaver Creek flows will be diverted into the Phase 1 Channel through the slowly timed placement of "super sacks" into the mainstem. Super sacks are filled with 1-inch (minus) clean washed drain rock (rather than sand), the sacks form to the bottom contours and seal tightly against each other. Should the bags split, the clean rock spills into the stream rather than releasing suspended sediment (as would happen if sand was used in that volume). As flow is diverted into Phase 1 Beaver Creek Diversion Channel, fish salvage efforts will be conducted concurrently throughout the Phase 1 Beaver Creek Diversion area. To reduce/eliminate stranding, fish salvage efforts would be timed to coincide with 0% (full flow), 25%, 50% and 75% reduction of flow, as estimated through the carefully timed placement of the super sacks.

As Beaver Creek watershed downstream from the diversion is carefully dewatered, crews (estimate 3-4 crews) will begin salvaging fish starting at the point of diversion and working downstream, systematically isolating then salvaging short (50 m), contiguous channel sections. This process will continue in a downstream direction to the confluence with Anderson Creek. As each 50 m, isolated section is salvaged for fish, the upstream stop net will be brought forward ("leap-frogged") and established 50 m downstream from the existing downstream net which now becomes the upstream net. This approach will be applied to mainstem, tributary and off-channel habitats.

To ensure continuous and effective fish removal, each salvage crew will be accompanied by a fish runner. All fish captured by the salvage crew will be placed in lined vessels. As those vessels are filled with fish and at the discretion of the Crew Supervisor, a runner will transport the salvaged fish to the established relocation sites (section 6.4) for release. Alternatively, fish may be held in larger aerated vessels and moved by truck depending on access. This approach ensures constant and continuous fish salvage effort, and also minimizes stress to fish being held in buckets where dissolved oxygen and/or increased temperature could adversely affect survival.

During the initial, "full flow" (100% discharge) fish salvage, the mainstem channel, connecting swales, and tributary confluences, will be flagged for reference during future salvages. Small, annotated (e.g., 0+50 m, 1+00 m, etc.) survey flags will be placed on both banks (mainstem, tributaries and channels) at 50 m or 100 m intervals, as practical.

Backpack electrofishing and minnow trapping (Gee type traps) will be the primary methods (depletion sampling) used for fish salvage operations guided by the current environmental conditions (flow levels, water temperatures, etc.). However, dip netting and beach seining will

also be used as/if required. Regardless of the primary fish collection technique, rocks with substantial interstices will be overturned and examined for fish presence.

For those 50 m sections that are best salvaged by electrofishing (e.g., shallow, negligible or moderate LWD), two consecutive passes with nil captures will indicate that the area has been adequately salvaged (at the current flow) and that the upstream stop net can be removed and relocated to its downstream position, and fish salvage in the next 50 m section can commence.

For those 50 m sections that are best salvaged by minnow trap effort (e.g., deeper, pool sections with abundant LWD), baited minnow traps (10-20 traps per 50 m section) will be fished for 12-24 hour periods repeatedly, and checked frequently, until nil fish are captured, or/if trap ineffectiveness precludes further trapping at the current water level.

The overall fish salvage program will involve a series of four, individual fish salvage events as described above for the full flow (100% discharge). Each successive fish salvage event will be completed at decreased flow: 75%, 50% and 25% of natural flow. These discharge levels in lower Beaver Creek will be regulated through the careful placements of super sacks at the Phase 1 Channel/Beaver Creek mainstem diversion site. Additional flows from a small tributary(ies) will also be collected and diverted into Phase 1 Channel via the Temporary Swale.

During the final fish salvage event (i.e., 25% flow/75% diversion), sampling effort will continue in each 50 m section until there are nil fish captured by any/all methods. A final visual inspection for any remaining stranded fish will be completed once all flows have been diverted.

#### **4.1.3. Proposed Fish Relocation Sites**

Several fish relocation sites have been identified (Figure 2) based on their proximity to salvage areas, and habitat potential, and are as follows:

- Anderson Creek, downstream from existing Beaver Creek confluence. This will be the primary release site for fish salvaged from the southern portion of Beaver Creek; and
- Beaver Creek Phase 1 Channel as flows permit. Fish will be relocated to these sites once 50% of flows have been established and turbidity levels are acceptable.

The precise location of the release sites will be subject to local conditions such as discharge, amount of available short-term and long-term cover, access, and connectivity to fish-bearing waters. All fish will be released into habitat types similar to those from which they were salvaged.

#### **4.1.4. Contingency planning**

Contingency planning is required to address, primarily, instantaneous large increases or decreases in flow during fish salvage events or potential cold weather events that could result in ice developing in the side and mainstem channels. In the event of ice formation, salvage

activities may have to be delayed until warmer weather conditions result in the melting of the ice and open water conditions re-established.

Increases in discharge and therefore connectivity of waterbodies in Phase 1 Beaver Creek Diversion, has the potential to re-distribute fish into areas that have previously been salvaged. Similarly, decreases in discharge and connectivity may strand fish in stream segments that have yet to be salvaged.

To reduce or eliminate the effects of increased discharge, if one of the side channels is determined in the field to be “dry”, “permanent” stop nets will be secured and left in place at tributary and dry swale confluences to the mainstem. This strategy will ensure that salvaged sections remain isolated during an increase in discharge and that fish are unable to in-migrate into the section through the “re-activation” of previously dry interconnecting channels.

Backpack electrofishing will be the preferred method of salvage while water temperatures remain above 5°C. Electrofishing is the most efficient method to capture the range of species and life stages present at the site and offers the lowest mortality and injury rates for fish. When water temperature drops below 5°C, minnow trapping and seining will be the preferred salvage methods while there is open water present. Minnow trapping and seining will remain effective and efficient even under conditions where a thin layer of ice forms overnight, but melts by mid-morning.

Salvage efficiency is expected to decrease when streams and wetlands become frozen over, and do not melt during the day. In such conditions, salvage will be limited to discrete areas required for imminent development (e.g. a discrete road crossing of a drainage). Under these conditions ice depth will be checked with an auger or by breaking ice with a metal pry bar. Work will proceed without the need for salvage when the stream is frozen to the channel substrates. If pools of water are present, the ice will be removed and the pools salvaged with a seine (a pole seine for small pools and a beach seine for larger pools). Exclusion netting will be used to prevent the migration of fish into the salvaged areas if there is sufficient depth and flows to provide continuous habitat. Minnow traps will be set during the day for up to 12 hour durations if depth allows, but will not be left overnight to ensure the traps can be retrieved without substantial ice depth reforming.

## **4.2. Workforce Accommodation Centre**

### **4.2.1. Area Setting**

The Workforce Accommodation Centre is located entirely in upper Beaver Creek (Figure 3), upstream from the Phase 1 Beaver Creek Diversion. Channels associated with this section of Beaver Creek represent tributary headwaters to the mainstem channel or ephemeral wetted

areas. Unidentified/unmapped waterbodies may also exist throughout the Workforce Accommodation Centre, depending on recent precipitation and/or snowmelt events. Fish salvage activities will address those waterbodies as conditions dictate.

These tributaries to Beaver Creek have low relief. There is no spawning habitat provided in the watercourses within these sites. These wetted areas of Beaver Creek only provide off-channel rearing and overwintering habitat as well as high water refuge habitats.

The Workforce Accommodation Centre is bounded on the west side by Haisla Boulevard, to the north and east by the Eurocan Haul Road and to the south by existing RT infrastructure.

#### **4.2.2. Proposed Fish Salvage Methodology**

Fish salvage activities will be straight forward and will involve the establishment of fish exclusion fences approximately 300 m downstream from the Workforce Accommodation Centre as well as at the culvert inlet under the Eurocan Haul Road to prevent in-migration/emigration into the Workforce Accommodation Centre (these are approximate locations to be confirmed during site visits).

Minnow trapping will be the primary fish salvage methods. As a contingency, and should temperatures permit, backpack electrofishing may be used if the minnow trapping is unsuccessful just to ensure that no fish are present.

Similar to the approach taken for Phase 1 Beaver Creek Diversion, all channels (perennial and ephemeral) will be de-marked every 50 m or 100 m with annotated hi-vis survey flags (0+50 m, 1+00 m, etc.) to facilitate identification of any required reference sites during subsequent salvages.

Immediately following each drawdown (25%, 50% and 75% of ambient flow) fish will be salvaged from the remaining wetted areas. Fish exclusion fences will be established at Eurocan Haul Road culvert inlet and at another location approximately 300 m downstream to allow construction and channel infilling to occur in that segment concurrently with works being completed in the Workforce Accommodation Centre.

As flow in the Workforce Accommodation Centre contributes to Beaver Creek discharge in the lower areas, a complete drawdown is not recommended (or required) for salvage operations in the Workforce Accommodation Centre. Following the final fish salvage, the installation of swales to allocate waters to the north along the outer perimeters of the proposed Workforce Accommodation Centre are required. Appropriate mitigation measures (sedimentation ponds, siltation fencing, etc.) would be established prior to water management activities.

Potential fish stranding in downstream areas ) will be monitored regularly after each drawdown cycle in the Workforce Accommodation Centre. Any stranded fish in those areas will be salvaged and released into established relocation site(s).

Fish salvages will utilize repetitive, intensive minnow trapping and backpack electrofishing effort as conditions permit. Beach seining, dip netting and potentially boat electrofishing may prove effective in the large channel/wetland areas. As with Beaver Creek Phase 1 Diversion, fish salvage events in the Workforce Accommodation Centre will utilize 3-4 standard salvage crews comprised of supervisor, technical assistant and a fish runner to ensure continuous fishing effort and to minimize fish stress.

#### **4.2.3. Proposed Fish Relocation Sites**

Preliminary fish relocation sites have been identified in the Beaver Creek tributary draining the Workforce Accommodation Centre near the confluence with the mainstem and in the pond (stickleback re-location) that lies adjacent to the Haul road near to Anderson (Figure 3). The exact location of the relocation sites will be subject to ambient conditions such as discharge, access and connectivity to fish-bearing waters.

As previously stated all salvaged fish would be released unharmed into habitat types similar to those they were captured from. However, as large quantities of stickleback are expected to be salvaged in the Workforce Accommodation Centre area they will be released into the pond area adjacent to the Haul road as they will provide sticklebacks preferred habitat conditions i.e. slow moving wetland habitat.

#### **4.2.4. Contingency Planning**

Depending on discharge (water level), channel connectivity and dewatering effectiveness, flow diversion or isolation measures may be required. Current construction planning proposes the excavation of three swales to divert surface drainage to the north, and a central ditch to collect and transport flows to the south culvert site under the Eurocan Haul Road.

Should inflow volume into the Workforce Accommodation Centre or sustained, significant precipitation preclude the effectiveness of the pump and drawdown process, or the drawdown process causes significant fish stranding in downstream habitats, a step-wise, isolate-infill-isolate-infill approach could be considered. This approach would involve the salvage of fish from a discrete, isolated area (net enclosed) of channel or wetland. Once all fish have been removed from the manageable, isolated area (e.g., 50 m x 10 m) through repetitive electrofishing and/or minnow trapping the area could be carefully infilled with clean materials (minimal sediment attached). This process will be repeated until all aquatic habitat has been infilled. All salvaged fish would be relocated as described above.

Also as a contingency, due to the deep nature of some channels and the wetland area(s) in the Workforce Accommodation Centre, fish salvage activities may require an initial drawdown (20 – 25% of ambient flow) using screened pumps to concentrate fish into deeper sections and facilitate capture. Pump sites (and potential sumps) could be established at the main culvert (primary outlet) under the Eurocan Haul Road. All pumped drawdown methods would follow the Freshwater Intake End-of-Pipe Fish Screen Guideline established by DFO (1995).

Cold weather, and in particular weather that will promote ice formation (cold combined with strong outflow winds) can result in the collection of frazil ice on the exclusion fences downstream from the Workforce Accommodation Centre, in effect creating a “dam” that would result in the stream migrating around the exclusion fence and possibly resulting in the collapse of the fence. In these conditions, consideration should be given to breaching the fence to maintain its integrity. With the cold weather and water, it is unlikely that juvenile fish will be migrating past the site so the risk for re-populating the isolated area would be low. Nevertheless, a breaching of any fence will result in the need for subsequent fish salvage prior to any associated instream works.

Backpack electrofishing will be the preferred method of salvage while water temperatures remain above 5°C. Electrofishing is the most efficient method to capture the range of species and life stages present at the site and offers the lowest mortality and injury rates for fish. When water temperature drops below 5°C, minnow trapping and seining will be the preferred salvage methods while there is open water present. Minnow trapping and seining will remain effective and efficient even under conditions where a thin layer of ice forms overnight, but melts by mid-morning.

Salvage efficiency is expected to decrease when streams and wetlands become frozen over, and do not melt during the day. In such conditions, salvage will be limited to discrete areas required for imminent development (e.g. a discrete road crossing of a drainage). Under these conditions ice depth will be checked with an auger or by breaking ice with a metal pry bar. Work will proceed without the need for salvage when the stream is frozen to the channel substrates. If pools of water are present, the ice will be removed and the pools salvaged with a seine (a pole seine for small pools and a beach seine for larger pools). Exclusion netting will be used to prevent the migration of fish into the salvaged areas if there is sufficient depth and flows to provide continuous habitat. Minnow traps will be set during the day for up to 12 hour durations if depth allows, but will not be left overnight to ensure the traps can be retrieved without substantial ice depth reforming.

### **4.3. Kitimat River Side Channel**

#### **4.3.1. Area Setting**

Kitimat River Side Channel is located south east of the former Methanol Plant (Figure 4). The channel flows in a north to south direction across a large meander in Kitimat River. The main channel is fed by three “overflow” inlets, originating along the south bank of the Kitimat River. The three channels converge about 300 – 500 m downstream from the Kitimat mainstem. The main side channel also receives seasonal input from a smaller off-channel habitat about 700 m downstream from the channels’ origin in Kitimat River.

The Kitimat River Side Channel empties into a broader, tidally influenced Kitimat off-channel (ox-bow), about 200 m upstream from the outlet of the Kitimat River Side Channel Realignment (offset). The off-channel is also fed by another blind channel about 1.0 km in length. The direction of flow in this channel is likely dependent on tide and ambient freshwater flow conditions.

Riparian areas comprise mature coniferous and deciduous forest with a thick canopy cover offering abundant shade and cover. Additional cover is provided by overstream vegetation, LWD, and undercut banks. The Kitimat River supports a wide array of freshwater and anadromous fish species, including all five Pacific salmon (chinook, coho, chum, pink, and sockeye salmon), trout (steelhead, rainbow [*Oncorhynchus mykiss*], and cutthroat), char (Dolly Varden) and several non-salmonid species (MacDonald and Shepherd 1983; BC MOE 2014). Eulachon are known to spawn in the Kitimat River in late winter/early spring in the vicinity of the Project area (Pedersen et al. 1995).

A debris jam at the upstream end of the side channel partially blocks flow from the Kitimat River mainstem. As such, most fish migration throughout the oxbow channel likely comes from the downstream end.

#### **4.3.2. Proposed Fish Salvage Methodology**

The primary fish salvage methods would include, beach and pole seining and minnow trapping. Three to four crews of three personnel each (supervisor, technical support, fish runner) will conduct the fish salvage. Backpack electrofishing may be employed to ensure that all fish have been removed from the side channel.

As described for the other areas, fish salvages would commence at the upstream end and proceed in a downstream direction. During the initial salvage at 100% flows, both banks would be demarked with hi-vis, annotated flagging at 50 m or 100 m stations. Fine mesh (3/8 inch) stop nets would be established to isolate discrete 50 m sections. Following the salvage of all fish (or as



many as practicable), the upstream net is advanced downstream by 100 m to become the downstream net, and depletion sampling is continued downstream to the Kitimat River Dyke.

Kitimat River mainstem flows will be diverted away from the four channel inlets through the slowly timed placement of clean (sediment free) rip rap, super sacks or another suitable diversion material at the inlets. As flow is diverted away from the channel inlets, fish salvage efforts will be conducted as described above. To reduce/eliminate stranding, fish salvage efforts would be timed to coincide with 0% (full flow), 25%, 50% and 75% reduction of flow, as estimated through the carefully timed closure of the mainstem channel.

#### **4.3.3. Proposed Fish Relocation Sites**

Preliminary fish relocation sites have been identified at several locations (Figure 4) in the lower end of the channel and/or several other smaller channels in the area. The exact location of the relocation sites will be subject to ambient conditions such as discharge, salinity, access and connectivity to fish-bearing waters.

All salvaged fish would be released unharmed into habitat types similar to those they were captured from. Care will be taken to ensure young-of-the-year coho salmon are released into appropriate habitat types (e.g., abundant LWD, pool type) and that other un-smolted salmonids are not released into tidally influenced water. Salinity will be measured at all side channel sites prior to release.

#### **4.3.4. Contingency Planning**

Contingency planning is required to address, primarily, instantaneous, large increases or decreases in flow during fish salvage events. In addition to an increase of waterbody connectivity, increases in discharge will often stimulate salmon and/or trout to migrate into freshwater habitats at certain times of the year.

To reduce the effects of substantially decreased discharge, “permanent” stop nets will be established in tributary and channel headwater sections and at interconnecting channel confluences that were effectively (100%) salvaged during the initial salvage event at full flow (i.e., prior to diversion). This strategy will minimize/eliminate fish stranding and restrict inter-channel, upstream and downstream movement.

To reduce or eliminate the effects of increased discharge, “permanent” stop nets will be secured and left in place at tributary and dry swale confluences to the mainstem. This strategy will ensure that salvaged sections remain isolated during an increase in discharge and that fish are unable to immigrate into the section through the “re-activation” of previously dry interconnecting channels.

Cold weather, and in particular weather that will promote ice formation (cold combined with strong outflow winds) can result in the collection of frazil ice on the exclusion fences across the Kitimat Side Channel, in effect creating a “dam” that would result in the stream migrating around the exclusion fence and possibly resulting in the collapse of the fence. In these conditions, consideration should be given to breaching the fence to maintain its integrity. With the cold weather and water, it is unlikely that juvenile fish will be migrating past the site so the risk for re-populating the isolated area would be low.

Backpack electrofishing will be the preferred method of salvage while water temperatures remain above 5°C. Electrofishing is the most efficient method to capture the range of species and life stages present at the site and offers the lowest mortality and injury rates for fish. When water temperature drops below 5°C, minnow trapping and seining will be the preferred salvage methods while there is open water present. Minnow trapping and seining will remain effective and efficient even under conditions where a thin layer of ice forms overnight, but melts by mid-morning.

Salvage efficiency is expected to decrease when streams and wetlands become frozen over, and do not melt during the day. In such conditions, salvage will be limited to discrete areas required for imminent development (e.g. a discrete road crossing of a drainage). Under these conditions ice depth will be checked with an auger or by breaking ice with a metal pry bar. Work will proceed without the need for salvage when the stream is frozen to the channel substrates. If pools of water are present, the ice will be removed and the pools salvaged with a seine (a pole seine for small pools and a beach seine for larger pools). Exclusion netting will be used to prevent the migration of fish into the salvaged areas if there is sufficient depth and flows to provide continuous habitat. Minnow traps will be set during the day for up to 12 hour durations if depth allows, but will not be left overnight to ensure the traps can be retrieved without substantial ice depth reforming.

#### **4.4. Phase 2 Beaver Creek Permanent Realignment**

##### **4.4.1. Area Setting**

As with the Phase 1 area, the Phase 2 of Beaver Creek Permanent Realignment is low relief, with several small, ephemeral tributaries to Anderson Creek, primarily in the downstream region within the realignment footprint. At least three potential ephemeral wetlands also occur along the west side of the Eurocan Haul Road.

#### 4.4.2. Proposed Fish Salvage Methodology

Completion of Phase 2 Beaver Creek Permanent Realignment will involve, at a minimum the following fish salvage activities:

- ensure fish (adult and juvenile) exclusion fencing is in place in the Workforce Accommodation Centre;
- as required, establish “permanent” isolation/exclusion fences in several interconnecting channels between Anderson Creek and the lower section of the Phase 2 Permanent Realignment Channel; and
- all tributaries, isolated channels and/or pools within each segment will be marked with annotated flagging (meter posts, unique numbers, etc.) for reference, and salvaged for fish immediately prior to site preparation activities and excavation; in some cases, “permanent” exclusion nets/fencing may be left in place during site preparation to preclude any fish in-migration into the work area as a result of potential increased precipitation and connectivity.

Stop nets will be installed across Beaver Creek near the downstream end of the Phase 1 Beaver Creek Diversion (if constructed) immediately prior to the tie in between the upper Beaver Creek and the new diversion channel. Once this net is installed, monitoring will be undertaken to ensure that any fish migration is not delayed unduly. Should the timing of this activity coincide with a spawning migration, consideration will be given to the installation of an adult trap to capture fish during the tie in and allow for transport of the adults past the work area.

All three segments of the Phase 2 Permanent Realignment Channel will be excavated in isolation from the mainstem of Beaver Creek and will remain disconnected to upstream and downstream fish bearing waters until the end of the construction period. Construction would occur in an in upstream direction beginning approximately 5 m upstream from Anderson Creek mainstem, and continuing upstream through the other channel segments.

Any small interconnecting channels or small tributaries encountered during the construction will be salvaged for fish; all fish will be released into lower Anderson Creek or nearby channels not scheduled for alteration. At this stage, the Phase 2 Permanent Realignment Channel remains unconnected to fish bearing water.

Turbid construction water from the channel can be pumped into proposed sedimentation ponds or vegetated area to prevent re-entry into the watercourse. Turbidity will be monitored at stations located downstream from the new confluence. Once the three segments have been excavated, tie-ins can begin, either at Anderson Creek, or between the three segments, beginning with the most downstream excavation. All tie-ins should be slowly and carefully

excavated to grade to minimize the release of any remaining turbid water into Anderson Creek mainstem.

Prior to any site preparation/channel excavation activity or fish salvage effort, a site reconnaissance will be conducted in Anderson Creek to determine the presence of any existing channels (perennial or ephemeral) that connect Anderson Creek to aquatic areas in the Phase 2 Beaver Creek Permanent Realignment area. If channels are identified, exclusion fencing supported by a chain link fence or other rigid frame (as/if required) would be erected to isolate the Phase 2 Beaver Creek Permanent Realignment area. Any such structures would require regular monitoring and cleaning; more frequently during precipitation events. Collectively, the downstream exclusion fences and those in upper the Phase 2 Beaver Creek Permanent Realignment area and eastern Workforce Accommodation Centre will effectively isolate the Phase 2 Beaver Creek Permanent Realignment area from fish in-migration.

Similar to previously described methods, the diversion of flows from upstream Beaver Creek into the Phase 2 Permanent Realignment Channel should happen in stages (see Section 4.3.3.2). As flows are diverted the remaining stream network west of Methanol plant and at the north end of Beaver Creek south of the Methanol plant will be salvaged (Figure 6) using the same approach outlined for the southern portion of Phase 1 Beaver Creek Diversion. Specifically, as the Beaver Creek watershed downstream from the diversion into the Phase 2 Permanent Realignment Channel is carefully dewatered, crews (estimate 3-4 crews) will begin salvaging fish starting at the point of diversion and working downstream, systematically isolating then salvaging short (50 m), contiguous channel sections. This process will continue in a downstream direction to the confluence of the downstream end of the Phase 1 Beaver Creek Diversion Channel with the unaffected mainstem of Beaver Creek. As each 50 m, isolated section is salvaged for fish, the upstream stop net will be brought forward ("leap-frogged") and established 50 m downstream from the existing downstream net which now becomes the upstream net. This approach will be applied to mainstem, tributary and off-channel habitats.

During the initial, "full flow" (100% discharge) fish salvage, the mainstem channel, connecting swales, and tributary confluences, will be flagged for reference during future salvages. Small, annotated (e.g., 0+50 m, 1+00 m, etc.) survey flags will be placed on both banks (mainstem, tributaries and channels) at 50 m or 100 m intervals, as practical.

Backpack electrofishing and minnow trapping (Gee type traps) will be the primary methods (depletion sampling) used for fish salvage operations guided by the current environmental conditions (flow levels, water temperatures, etc.). However, dip netting and beach seining will also be used as/if required. Regardless of the primary fish collection technique, rocks with substantial interstices will be overturned and examined for fish presence.

For those 50 m sections that are best salvaged by electrofishing (e.g., shallow, negligible or moderate LWD), two consecutive passes with nil captures will indicate that the area has been adequately salvaged (at the current flow) and that the upstream stop net can be removed and relocated to its downstream position, and fish salvage in the next 50 m section can commence.

For those 50 m sections that are best salvaged by minnow trap effort (e.g., deeper, pool sections with abundant LWD), baited minnow traps (10-20 traps per 50 m section) will be fished for 12-24 hour periods repeatedly, and checked frequently, until nil fish are captured, or/if trap ineffectiveness precludes further trapping at the current water level.

The overall fish salvage program will involve a series of four, individual fish salvage events as described above for the full flow (100% discharge). Each successive fish salvage event will be completed at decreased flow: 75%, 50% and 25% of natural flow.

During the final fish salvage event (i.e., 25% flow/75% diversion), sampling effort will continue in each 50 m section until there are nil fish captured by any/all methods. A final visual inspection for any remaining stranded fish will be completed once all flows have been diverted.

#### **4.4.3. Proposed Fish Relocation Sites**

Several fish relocation sites have been identified (Figures 5 and 6) based on their proximity to salvage areas, and habitat potential, and are as follows:

- above the Phase 2 Permanent Realignment tie-in in Beaver Creek mainstem;
- the unaffected portion of the Beaver Creek mainstem; and
- in the Phase 2 Permanent Realignment Channel.

All salvaged fish would be released unharmed into habitat types similar to those they were captured from. Care will be taken to ensure young-of-the-year coho salmon are released into appropriate habitat types (e.g., abundant LWD, pool type) and that other un-smolted salmonids are not released into tidally influenced water. Salinity will be measured at all side channel sites prior to release.

#### **4.4.4. Contingency Planning**

Contingency planning is required to address, primarily, instantaneous, large increases or decreases in flow during fish salvage events. In addition to an increase of waterbody connectivity, increases in discharge will often stimulate salmon and/or trout to migrate into freshwater habitats at certain times of the year.

To reduce or eliminate the effects of increased discharge, “permanent” stop nets will be secured and left in place at tributary and dry swale confluences to the mainstem. This strategy will ensure that salvaged sections remain isolated during an increase in discharge and that fish

are unable to in-migrate into the section through the “re-activation” of previously dry interconnecting channels.

Backpack electrofishing will be the preferred method of salvage while water temperatures remain above 5°C. Electrofishing is the most efficient method to capture the range of species and life stages present at the site and offers the lowest mortality and injury rates for fish. When water temperature drops below 5°C, minnow trapping and seining will be the preferred salvage methods while there is open water present. Minnow trapping and seining will remain effective and efficient even under conditions where a thin layer of ice forms overnight, but melts by mid-morning.

Salvage efficiency is expected to decrease when streams and wetlands become frozen over, and do not melt during the day. In such conditions, salvage will be limited to discrete areas required for imminent development (e.g. a discrete road crossing of a drainage). Under these conditions ice depth will be checked with an auger or by breaking ice with a metal pry bar. Work will proceed without the need for salvage when the stream is frozen to the channel substrates. If pools of water are present, the ice will be removed and the pools salvaged with a seine (a pole seine for small pools and a beach seine for larger pools). Exclusion netting will be used to prevent the migration of fish into the salvaged areas if there is sufficient depth and flows to provide continuous habitat. Minnow traps will be set during the day for up to 12 hour durations if depth allows, but will not be left overnight to ensure the traps can be retrieved without substantial ice depth reforming.

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# APPENDIX 1. FISH SALVAGE MONITORING REPORT TEMPLATE



